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State University of New York at Plattsburgh
Auditory Research Laboratories

Report No. ARL 86-2

The Effects of Blast Trauma (Impulse Noise)
on Hearing: A Parametric Study

Final Report
Part 1

Roger P. Hamerik
William A. Ahroon
George A. Turrentine

July 21, 1988

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Callier Center for Communication Disorders
The University of Texas at Dallas
Dallas, Texas 75235

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ABSTRACT

There are three broad goals to this project. The first and primary goal is to begin the systematic development of a data base from which one could estimate the hazards to hearing resulting from exposure to blast waves or other high level impulse noise transients. To achieve this primary objective the following two objectives must first be achieved: (1) to develop a methodology to efficiently acquire data on a large number of experimental animals that have been exposed to a variety of blast wave configurations. This includes audiometric, histological and acoustic variables; (2) to develop a set of blast wave simulation devices which can reliably generate blast waves with a variable distribution of spectral energy in a laboratory environment. This report will describe progress that was achieved on each of these objectives. Before the project termination, data acquisition was completed on 70 chinchillas that were exposed to one of a series of very low frequency (125 Hz) energy-content blast wave exposure paradigms. This data represents part of the first of four phases of a parametric study that was designed to estimate the contributions of individual blast wave exposure variables on the production of hearing loss. Hearing function was measured using the auditory evoked potential (AEP) technique. The evaluation of hearing consisted of pre- and postexposure measurements of pure tone thresholds and tuning curves (masked thresholds). Quantitative and qualitative data on each experimental cochlea was obtained from the traditional surface preparation technique. The objective of this approach was to correlate the exposure variables with functional and morphological indices of trauma. The blast waves used in this first study were generated using a conventional compressed air-driven shock tube. The following blast wave parameters were studied:

1. Intensity of the blast wave. The intensity was characterized by the peak sound pressure level of the initial positive over pressure, and by the total energy (J/m^2) of the exposure. Three intensities were used; 150, 155, and 160 dB peak SPL.
2. Inter-stimulus interval (ISI) i.e., the effects of repetition rate. Rates of 1/m, 10/m, and 1/10m were used.
3. Total number of impulses (N), where $N = 1, 10$ and 100 .

The original goals of the project were not completed because the principal investigator moved from the University of Texas at Dallas to the State University of New York at Plattsburgh. Of the 21 groups specified in the original project, 13 were completed before moving. This report includes the raw data collected for those 13 groups. The remaining eight groups will be completed at the State University of New York at Plattsburgh (DAMD17-86-C-6172) and a final summary report will contain a detailed analysis of the data from all 21 groups.

Keywords: physiological effects; stress physiology;
hearing; blast waves; exposure physiology;
-table data; (KT)



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FOREWORD

Disclaimer

Citations of commercial organizations and trade names in this report do not constitute an official Department of the Army endorsement or approval of the products or services of these organizations.

Animal Use

In conducting the research described in this report, the investigators adhered to the "Guide for the Care and use of Laboratory Animals," prepared by the Committee on Care and Use of Laboratory Animals of the Institute of Laboratory Animal Resources, National Research Council (DHHS Publication No. (NIH) 86-23, revised 1985).

Statement of Progress: During the first year of this project, our primary goal was to obtain hearing threshold data, tuning curves and histological data on chinchillas that were exposed under a variety of conditions to low frequency energy-content blast waves. The source of these blast waves was a modified 6" x 6" cross section shock tube which terminated in an exponential horn. A minimum of five animals constituted an experimental group. The experimental groups that were to be run are detailed in the table. Twenty-one groups of animals constituted this phase of the project. Thirteen of the 21 groups have been completed. [The groups not completed are indicated by dashes under the symbol for sample size (N)]. The remaining eight groups have not been completed because of the premature termination of the project due to the move of the principal investigator from the University of Texas at Dallas to the State University of New York at Plattsburgh.

Table of Experimental Groups

| Group | N | Intensity | Number | Rate |
|-------|----|-----------------|--------|------------------|
| 1 | 4 | 150 dB Peak SPL | 1 | |
| 2 | -- | 150 dB Peak SPL | 10 | 10 per minute |
| 3 | 5 | 150 dB Peak SPL | 10 | 1 per minute |
| 4 | -- | 150 dB Peak SPL | 10 | 1 per 10 minutes |
| 5 | -- | 150 dB Peak SPL | 100 | 10 per minute |
| 6 | 6 | 150 dB Peak SPL | 100 | 1 per minute |
| 7 | -- | 150 dB Peak SPL | 100 | 1 per 10 minutes |
| 8 | 6 | 155 dB Peak SPL | 1 | |
| 9 | 5 | 155 dB Peak SPL | 10 | 10 per minute |
| 10 | 5 | 155 dB Peak SPL | 10 | 1 per minute |
| 11 | 5 | 155 dB Peak SPL | 10 | 1 per 10 minutes |
| 12 | 6 | 155 dB Peak SPL | 100 | 10 per minute |
| 13 | 6 | 155 dB Peak SPL | 100 | 1 per minute |
| 14 | 5 | 155 dB Peak SPL | 100 | 1 per 10 minutes |
| 15 | 6 | 160 dB Peak SPL | 1 | |
| 16 | -- | 160 dB Peak SPL | 10 | 10 per minute |
| 17 | 6 | 160 dB Peak SPL | 10 | 1 per minute |
| 18 | -- | 160 dB Peak SPL | 10 | 1 per 10 minutes |
| 19 | -- | 160 dB Peak SPL | 100 | 10 per minute |
| 20 | 5 | 160 dB Peak SPL | 100 | 1 per minute |
| 21 | -- | 160 dB Peak SPL | 100 | 1 per 10 minutes |
| Total | 70 | | | |

The Appendix contains the raw data and summary statistics for the 13 completed groups. The shock tube produced a blast wave that had the bulk of its energy in the octave band centered at 125 Hz. The data set for each exposed animal consisted of preexposure measures of hearing, recovery threshold measures, permanent threshold shift (PTS) measures and histology. Three preexposure audiometric thresholds were measured at 0.5, 1.0, 2.0, 4.0, 8.0, 11.2, and 16.0 kHz. Postexposure recovery functions were measured on each animal at postexposure times of $t = 0, 2, 8, 24,$ and 240 hours at test frequencies of 0.5, 2.0 and 8.0 kHz. At 30 days postexposure three final audiograms were collected on each animal at each of the audiometric test frequencies to establish each animals PTS. In addition, tuning curves were collected for each animal at probe frequencies of 0.5, 1.0, 2.0, 4.0, 8.0 and

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11.2 kHz prior to exposure and at 30 days postexposure. After the thirty-day testing was complete, each animal was sacrificed by decapitation and the cochlea was examined using the surface preparation histology procedure which yields a quantitative analysis of the sensory cell population in the cochlea.

A detailed analysis of the data will be presented in a summary report following the completion of the remaining eight groups.

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Appendix

**Individual and Group Statistics from:
The Effects of Blast Trauma (Impulse Noise)
on Hearing: A Parametric Study**

Part 1

Summary Data for the Group Exposed to:

150 dB, 1X

Animal

| | | |
|------|---|------------------------------------|
| 2071 | - | Completed the Entire Protocol |
| 2073 | - | Completed the Entire Protocol |
| 2084 | - | Completed the Entire Protocol |
| 2090 | - | Completed the Entire Protocol |
| 2074 | - | No Audiometric Data: Bad Electrode |

150 dB 1X

PRE-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 2071 | 12.5 | 9.2 | 15.8 | 4.2 | 27.5 | 29.2 | ***** |
| 2073 | 36.3 | 30.0 | 33.5 | 17.5 | 25.0 | 23.3 | ***** |
| 2084 | 30.0 | 20.0 | 15.0 | 11.3 | 31.2 | 26.5 | ***** |
| 2090 | 19.2 | 20.8 | 25.8 | 15.8 | 30.8 | 32.5 | 55.8 |
| Mean | 24.5 | 20.0 | 22.5 | 12.2 | 28.6 | 27.9 | 55.8 |
| S.D. | 10.7 | 8.5 | 8.8 | 6.0 | 3.0 | 3.9 | ***** |

POST-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 2071 | 12.5 | 7.5 | 12.5 | 0.8 | 24.2 | 19.2 | ***** |
| 2073 | 37.5 | 27.5 | 32.5 | 15.8 | 29.2 | 12.5 | ***** |
| 2084 | 15.8 | 12.5 | 10.8 | 9.2 | 37.5 | 25.8 | ***** |
| 2090 | 17.5 | 15.8 | 15.8 | 14.2 | 32.5 | 34.2 | 60.8 |
| Mean | 20.8 | 15.8 | 17.9 | 10.0 | 30.8 | 22.9 | 60.8 |
| S.D. | 11.3 | 8.5 | 9.9 | 6.7 | 5.6 | 9.3 | ***** |

PERMANENT THRESHOLD SHIFT (dB)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|-------|------|-------|------|------|-------|-------|
| 2071 | 0.0 | -1.7 | -3.3 | -3.3 | -3.3 | -10.0 | ***** |
| 2073 | 1.2 | -2.5 | -1.0 | -1.7 | 4.2 | -10.8 | ***** |
| 2084 | -14.2 | -7.5 | -4.2 | -2.1 | 6.2 | -0.7 | ***** |
| 2090 | -1.7 | -5.0 | -10.0 | -1.7 | 1.7 | 1.7 | 5.0 |
| Mean | -3.7 | -4.2 | -4.6 | -2.2 | 2.2 | -5.0 | 5.0 |
| S.D. | 7.1 | 2.6 | 3.8 | 0.8 | 4.1 | 6.4 | ***** |

150 dB 1X

TEMPORARY THRESHOLD SHIFT (dB)

| | | Frequency 0.5 kHz | | | | |
|-----------|------|-------------------|------|------|-------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 2071 | 10.0 | 10.0 | 5.0 | 0.0 | 5.0 | 10.0 |
| 2073 | 6.2 | 6.2 | 6.2 | 6.2 | -3.7 | 6.2 |
| 2084 | -2.5 | -12.5 | -7.5 | -7.5 | -12.5 | -2.5 |
| 2090 | -1.7 | -1.7 | 3.3 | -6.7 | -6.7 | 3.3 |
| Mean | 3.0 | 0.5 | 1.8 | -2.0 | -4.5 | 4.3 |
| S.D. | 6.1 | 9.9 | 6.3 | 6.4 | 7.3 | 5.3 |

| | | Frequency 2.0 kHz | | | | |
|-----------|------|-------------------|------|------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 2071 | 6.7 | 6.7 | 6.7 | 1.7 | 1.7 | 6.7 |
| 2073 | 19.0 | 14.0 | 14.0 | 9.0 | -6.0 | 19.0 |
| 2084 | 2.5 | -7.5 | -2.5 | -2.5 | -2.5 | 2.5 |
| 2090 | 1.7 | 6.7 | 1.7 | -8.3 | 1.7 | 6.7 |
| Mean | 7.5 | 5.0 | 5.0 | -0.0 | -1.3 | 8.7 |
| S.D. | 8.0 | 9.0 | 7.1 | 7.3 | 3.7 | 7.1 |

| | | Frequency 8.0 kHz | | | | |
|-----------|------|-------------------|------|-------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 2071 | 10.0 | 5.0 | 25.0 | 0.0 | 5.0 | 25.0 |
| 2073 | 27.5 | 27.5 | 32.5 | 27.5 | 12.5 | 32.5 |
| 2084 | -3.7 | -3.7 | 6.2 | 1.2 | 21.3 | 21.3 |
| 2090 | 1.7 | -3.3 | -8.3 | -13.3 | -8.3 | 1.7 |
| Mean | 8.9 | 6.4 | 13.9 | 3.9 | 7.6 | 20.1 |
| S.D. | 13.7 | 14.7 | 18.5 | 17.1 | 12.5 | 13.1 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 1X

Probe Frequency: 0.5 kHz

Masker (kHz): 0.150 0.200 0.300 0.400 0.520 0.600 0.650 0.750 1.300 2.200

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| 2071 (1.66) | 62.5 | 57.5 | 42.5 | 42.5 | 27.5 | 27.5 | 32.5 | 37.5 | 62.5 | 87.5 |
| 2073 (1.29) | 77.5 | 72.5 | 62.5 | 52.5 | 47.5 | 52.5 | 52.5 | 57.5 | 82.5 | 92.5 |
| 2084 (2.72) | 72.5 | 72.5 | 57.5 | 52.5 | 47.5 | 47.5 | 37.5 | 32.5 | 62.5 | 87.5 |
| 2090 (4.65) | 57.5 | 57.5 | 52.5 | 32.5 | 32.5 | 22.5 | 32.5 | 32.5 | 47.5 | 87.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (2.58) | 67.5 | 65.0 | 53.8 | 45.0 | 38.8 | 37.5 | 38.8 | 40.0 | 63.8 | 88.8 |
| S.D. (1.51) | 9.1 | 8.7 | 8.5 | 9.6 | 10.3 | 14.7 | 9.5 | 11.9 | 14.4 | 2.5 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|-------|
| 2071 (1.66) | 57.5 | 57.5 | 47.5 | 42.5 | 27.5 | 32.5 | 27.5 | 37.5 | 72.5 | 87.5 |
| 2073 (1.74) | 77.5 | 72.5 | 62.5 | 57.5 | 47.5 | 52.5 | 52.5 | 62.5 | 82.5 | 87.5 |
| 2084 (1.13) | 67.5 | 57.5 | 52.5 | 32.5 | 22.5 | 27.5 | 22.5 | 27.5 | 47.5 | 62.5 |
| 2090 (3.64) | 62.5 | 62.5 | 47.5 | 42.5 | 22.5 | 32.5 | 37.5 | 37.5 | 62.5 | 95.0* |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (2.04) | 66.3 | 62.5 | 52.5 | 43.7 | 30.0 | 36.3 | 35.0 | 41.3 | 66.3 | 83.1 |
| S.D. (1.10) | 8.5 | 7.1 | 7.1 | 10.3 | 11.9 | 11.1 | 13.2 | 14.9 | 14.9 | 14.2 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 1X

Probe Frequency: 1.0 kHz

| Masker (kHz): | 0.150 | 0.200 | 0.400 | 0.550 | 0.800 | 1.050 | 1.300 | 1.700 | 1.900 | 2.500 |
|------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 2071 (1.77) | 67.5 | 67.5 | 52.5 | 42.5 | 27.5 | 22.5 | 32.5 | 52.5 | 62.5 | 95.0* |
| 2073 (1.32) | 82.5 | 82.5 | 75.0* | 65.0* | 52.5 | 47.5 | 52.5 | 62.5 | 72.5 | 95.0* |
| 2084 (2.10) | 77.5 | 82.5 | 62.5 | 52.5 | 42.5 | 32.5 | 42.5 | 62.5 | 67.5 | 95.0* |
| 2090 (1.84) | 77.5 | 77.5 | 52.5 | 42.5 | 32.5 | 22.5 | 27.5 | 52.5 | 62.5 | 95.0* |
| Mean (1.75) | 76.3 | 77.5 | 60.6 | 50.6 | 38.8 | 31.2 | 38.8 | 57.5 | 66.3 | 95.0 |
| S.D. (0.32) | 6.3 | 7.1 | 10.7 | 10.7 | 11.1 | 11.8 | 11.1 | 5.8 | 4.8 | 0.0 |

| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
|------------------|---------------|-------|------|------|------|------|------|------|------|-------|
| 2071 (1.78) | 67.5 | 67.5 | 52.5 | 42.5 | 32.5 | 22.5 | 27.5 | 47.5 | 52.5 | 95.0* |
| 2073 (2.10) | 82.5 | 82.5 | 67.5 | 57.5 | 52.5 | 42.5 | 52.5 | 62.5 | 62.5 | 87.5 |
| 2084 (2.10) | 82.5 | 85.0* | 62.5 | 47.5 | 32.5 | 22.5 | 32.5 | 52.5 | 57.5 | 87.5 |
| 2090 (1.91) | 77.5 | 72.5 | 57.5 | 47.5 | 22.5 | 27.5 | 47.5 | 57.5 | 72.5 | 95.0* |
| Mean (1.97) | 77.5 | 75.9 | 60.0 | 48.8 | 35.0 | 28.8 | 40.0 | 55.0 | 61.3 | 91.3 |
| S.D. (0.16) | 7.1 | 8.3 | 6.5 | 6.3 | 12.6 | 9.5 | 11.9 | 6.5 | 8.5 | 4.3 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 1X

Probe Frequency: 2.0 kHz

Masker (kHz): 0.300 0.750 0.900 1.300 1.700 2.050 2.200 3.000 3.500 4.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|-------|-------|
| 2071 (1.58) | 67.5 | 42.5 | 42.5 | 52.5 | 37.5 | 27.5 | 32.5 | 37.5 | 42.5 | 87.5 |
| 2073 (1.62) | 72.5 | 62.5 | 52.5 | 57.5 | 52.5 | 47.5 | 47.5 | 67.5 | 95.0* | 97.5 |
| 2084 (6.05) | 67.5 | 52.5 | 42.5 | 32.5 | 37.5 | 22.5 | 37.5 | 47.5 | 77.5 | 95.0* |
| 2090 (2.18) | 72.5 | 52.5 | 47.5 | 37.5 | 22.5 | 27.5 | 32.5 | 47.5 | 95.0* | 95.0* |
| Mean (2.86) | 70.0 | 52.5 | 46.3 | 45.0 | 37.5 | 31.2 | 37.5 | 50.0 | 77.5 | 93.7 |
| S.D. (2.15) | 2.9 | 8.2 | 4.8 | 11.9 | 12.2 | 11.1 | 7.1 | 12.6 | 24.7 | 4.3 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|-------|-------|
| 2071 (4.09) | 67.5 | 42.5 | 42.5 | 42.5 | 32.5 | 22.5 | 32.5 | 42.5 | 57.5 | 95.0* |
| 2073 (3.25) | 77.5 | 62.5 | 52.5 | 57.5 | 57.5 | 42.5 | 47.5 | 62.5 | 85.0* | 95.0* |
| 2084 (1.62) | 72.5 | 47.5 | 47.5 | 37.5 | 32.5 | 27.5 | 27.5 | 47.5 | 72.5 | 95.0* |
| 2090 (1.49) | 47.5 | 47.5 | 32.5 | 42.5 | 22.5 | 22.5 | 17.5 | 22.5 | 57.5 | 90.0* |
| Mean (2.61) | 66.3 | 50.0 | 43.7 | 45.0 | 36.3 | 28.8 | 31.2 | 43.7 | 68.1 | 93.7 |
| S.D. (1.27) | 13.1 | 8.7 | 8.5 | 8.7 | 14.9 | 9.5 | 12.5 | 16.5 | 13.3 | 2.5 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 1x

Probe Frequency: 4.0 kHz

Masker (kHz): 0.450 1.300 2.200 3.000 3.500 4.100 4.500 5.000 5.600 6.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| 2071 (3.65) | 67.5 | 52.5 | 47.5 | 32.5 | 22.5 | 17.5 | 32.5 | 52.5 | 67.5 | 82.5 |
| 2073 (1.95) | 77.5 | 82.5 | 57.5 | 42.5 | 37.5 | 37.5 | 47.5 | 62.5 | 77.5 | 82.5 |
| 2084 (3.49) | 77.5 | 57.5 | 57.5 | 47.5 | 32.5 | 27.5 | 37.5 | 67.5 | 82.5 | 82.5 |
| 2090 (3.26) | 67.5 | 52.5 | 57.5 | 37.5 | 27.5 | 22.5 | 32.5 | 42.5 | 57.5 | 72.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (3.09) | 72.5 | 61.3 | 55.0 | 40.0 | 30.0 | 26.3 | 37.5 | 56.2 | 71.3 | 80.0 |
| S.D. (0.78) | 5.8 | 14.4 | 5.0 | 6.5 | 6.5 | 8.5 | 7.1 | 11.1 | 11.1 | 5.0 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| 2071 (2.33) | 72.5 | 47.5 | 52.5 | 32.5 | 22.5 | 22.5 | 32.5 | 52.5 | 57.5 | 72.5 |
| 2073 (2.57) | 72.5 | 62.5 | 52.5 | 42.5 | 32.5 | 32.5 | 47.5 | 62.5 | 77.5 | 77.5 |
| 2084 (3.72) | 72.5 | 57.5 | 52.5 | 37.5 | 22.5 | 32.5 | 47.5 | 67.5 | 77.5 | 82.5 |
| 2090 (3.53) | 67.5 | 52.5 | 57.5 | 37.5 | 37.5 | 27.5 | 32.5 | 47.5 | 62.5 | 77.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (3.04) | 71.3 | 55.0 | 53.8 | 37.5 | 28.8 | 28.8 | 40.0 | 57.5 | 68.7 | 77.5 |
| S.D. (0.69) | 2.5 | 6.5 | 2.5 | 4.1 | 7.5 | 4.8 | 8.7 | 9.1 | 10.3 | 4.1 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 1X

Probe Frequency: 8.0 kHz

Masker (kHz): 0.450 1.300 2.500 5.900 7.000 8.100 9.300 11.000 12.700 14.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|-------|------|-------|
| 2071 (0.82) | 77.5 | 57.5 | 62.5 | 42.5 | 47.5 | 47.5 | 42.5 | 52.5 | 72.5 | 82.5 |
| 2073 (1.28) | 82.5 | 67.5 | 57.5 | 47.5 | 42.5 | 42.5 | 52.5 | 75.0* | 87.5 | 92.5 |
| 2084 (3.52) | 77.5 | 62.5 | 57.5 | 42.5 | 42.5 | 32.5 | 42.5 | 52.5 | 57.5 | 72.5 |
| 2090 (2.13) | 72.5 | 62.5 | 67.5 | 47.5 | 42.5 | 37.5 | 42.5 | 62.5 | 72.5 | 95.0* |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (1.94) | 77.5 | 62.5 | 61.3 | 45.0 | 43.7 | 40.0 | 45.0 | 60.6 | 72.5 | 85.6 |
| S.D. (1.19) | 4.1 | 4.1 | 4.8 | 2.9 | 2.5 | 6.5 | 5.0 | 10.7 | 12.2 | 10.3 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|-------|-------|-------|
| 2071 (0.87) | 72.5 | 62.5 | 57.5 | 42.5 | 42.5 | 47.5 | 42.5 | 62.5 | 97.5 | 97.5 |
| 2073 (3.00) | 82.5 | 77.5 | 67.5 | 42.5 | 42.5 | 32.5 | 37.5 | 57.5 | 77.5 | 95.0* |
| 2084 (5.29) | 87.5 | 67.5 | 62.5 | 52.5 | 62.5 | 47.5 | 62.5 | 85.0* | 95.0* | 97.5 |
| 2090 (2.00) | 72.5 | 57.5 | 57.5 | 47.5 | 42.5 | 37.5 | 37.5 | 62.5 | 62.5 | 82.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (2.79) | 78.8 | 66.3 | 61.3 | 46.3 | 47.5 | 41.3 | 45.0 | 66.9 | 83.1 | 93.1 |
| S.D. (1.88) | 7.5 | 8.5 | 4.8 | 4.8 | 10.0 | 7.5 | 11.9 | 12.3 | 16.4 | 7.2 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB LX

Probe Frequency: 11.2 kHz

Masker (kHz): 1.000 4.000 7.000 9.000 11.000 11.500 12.000 13.000 14.500 16.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|-------|
| 2071 (3.52) | 72.5 | 57.5 | 62.5 | 57.5 | 47.5 | 47.5 | 42.5 | 47.5 | 67.5 | 95.0* |
| 2073 (5.36) | 77.5 | 77.5 | 82.5 | 62.5 | 42.5 | 47.5 | 52.5 | 72.5 | 77.5 | 87.5 |
| 2084 (3.61) | 82.5 | 62.5 | 67.5 | 57.5 | 37.5 | 42.5 | 37.5 | 47.5 | 67.5 | 95.0* |
| 2090 (4.80) | 62.5 | 57.5 | 57.5 | 57.5 | 37.5 | 42.5 | 42.5 | 62.5 | 62.5 | 67.5 |
| Mean (4.32) | 73.8 | 63.8 | 67.5 | 58.8 | 41.3 | 45.0 | 43.7 | 57.5 | 68.7 | 86.3 |
| S.D. (0.91) | 8.5 | 9.5 | 10.8 | 2.5 | 4.8 | 2.9 | 6.3 | 12.2 | 6.3 | 13.0 |

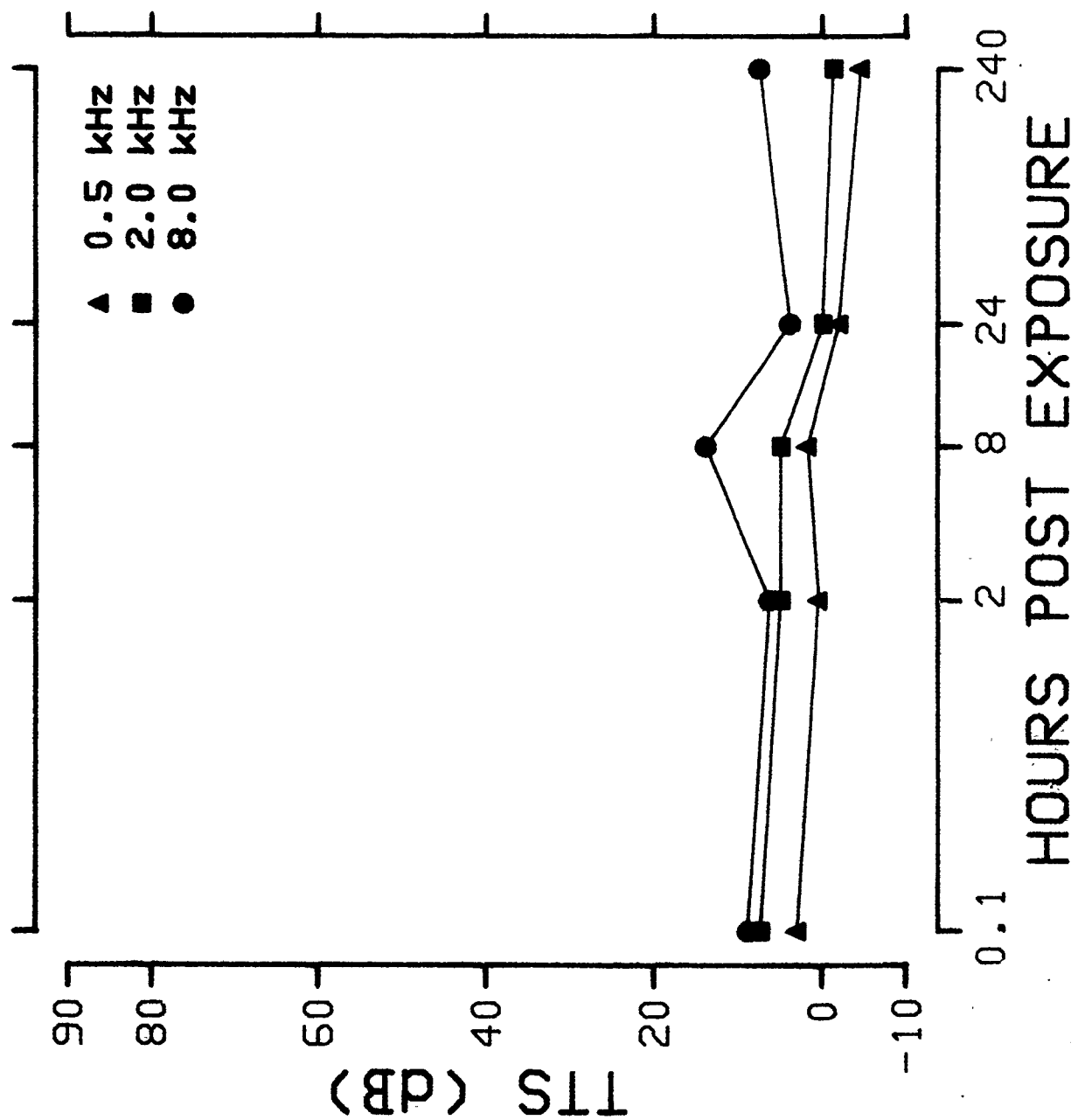
Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|-------|------|------|------|------|------|------|
| 2071 (3.29) | 67.5 | 52.5 | 57.5 | 57.5 | 37.5 | 42.5 | 42.5 | 42.5 | 67.5 | 77.5 |
| 2073 (6.89) | 67.5 | 52.5 | 62.5 | 47.5 | 22.5 | 27.5 | 37.5 | 47.5 | 82.5 | 87.5 |
| 2084 (4.14) | 77.5 | 62.5 | 67.5 | 65.0* | 32.5 | 37.5 | 32.5 | 42.5 | 72.5 | 82.5 |
| 2090 (4.53) | 67.5 | 52.5 | 62.5 | 57.5 | 37.5 | 32.5 | 37.5 | 42.5 | 62.5 | 82.5 |
| Mean (4.71) | 70.0 | 55.0 | 62.5 | 56.9 | 32.5 | 35.0 | 37.5 | 43.7 | 71.3 | 82.5 |
| S.D. (1.54) | 5.0 | 5.0 | 4.1 | 7.2 | 7.1 | 6.5 | 4.1 | 2.5 | 8.5 | 4.1 |

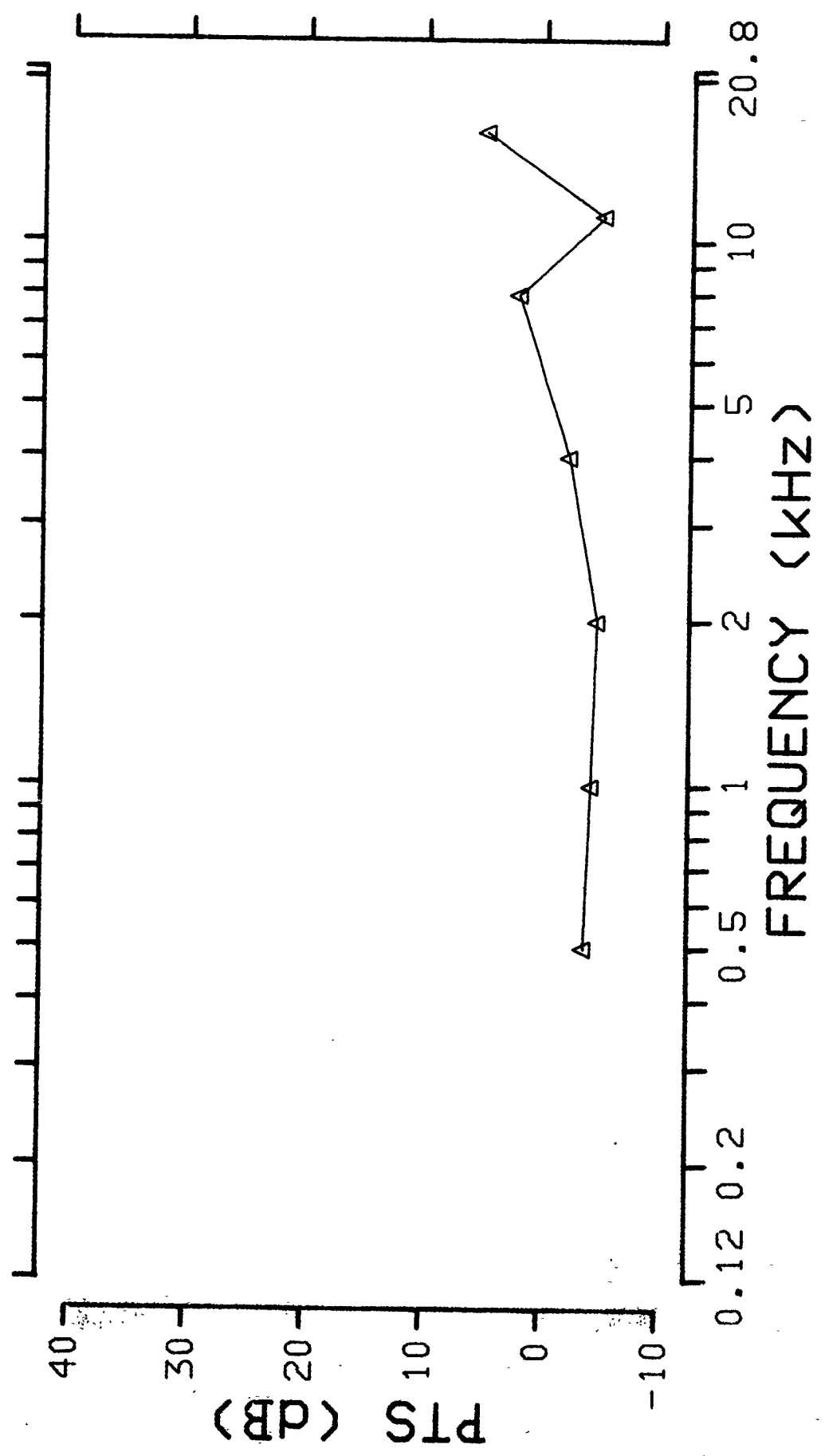
The Group Mean Recovery Curves
Measured at Three Test Frequencies

MEAN DATA (n=4) - 150 dB 1X



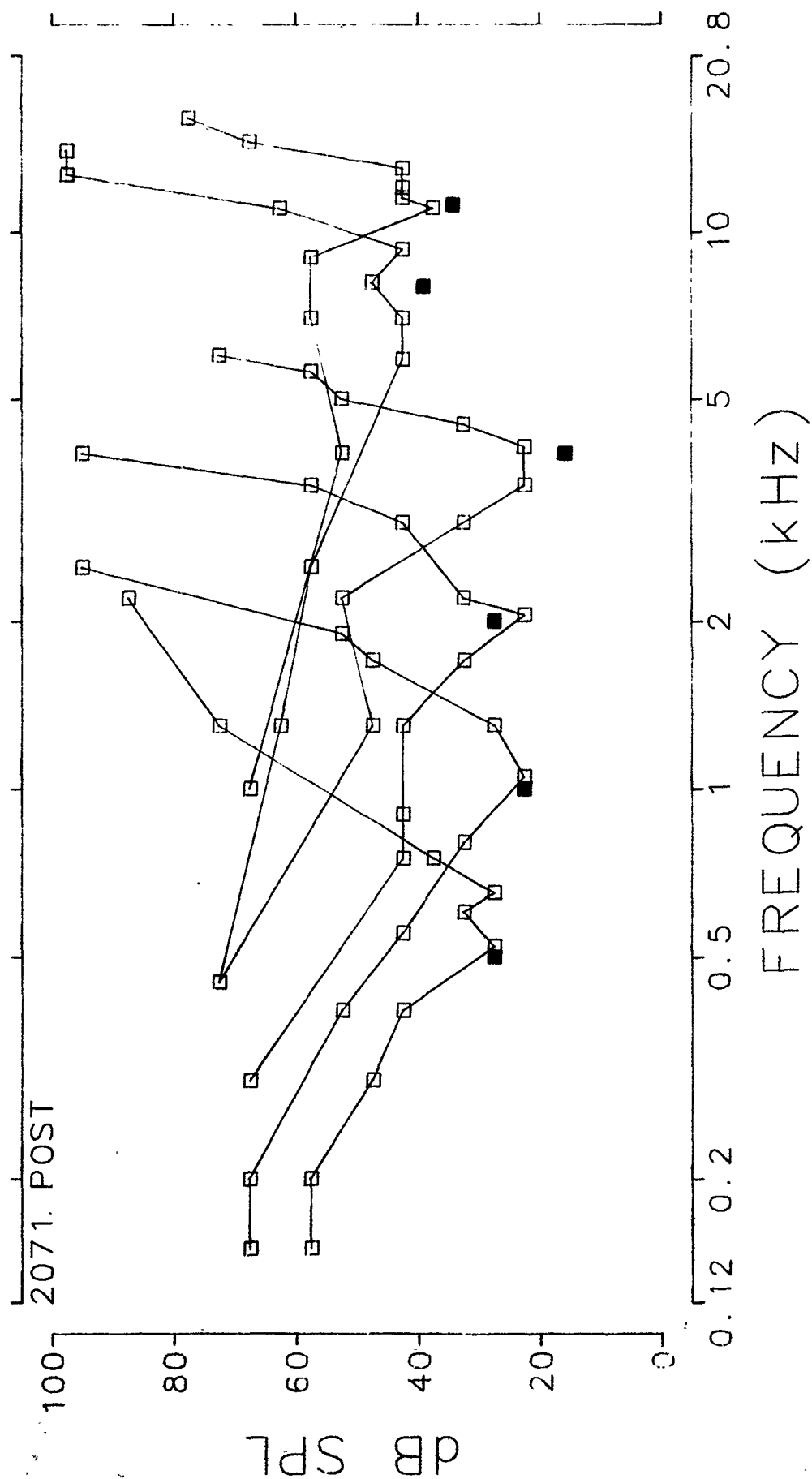
The Group Mean Permanent Threshold Shift (PTS)
for all Test Frequencies

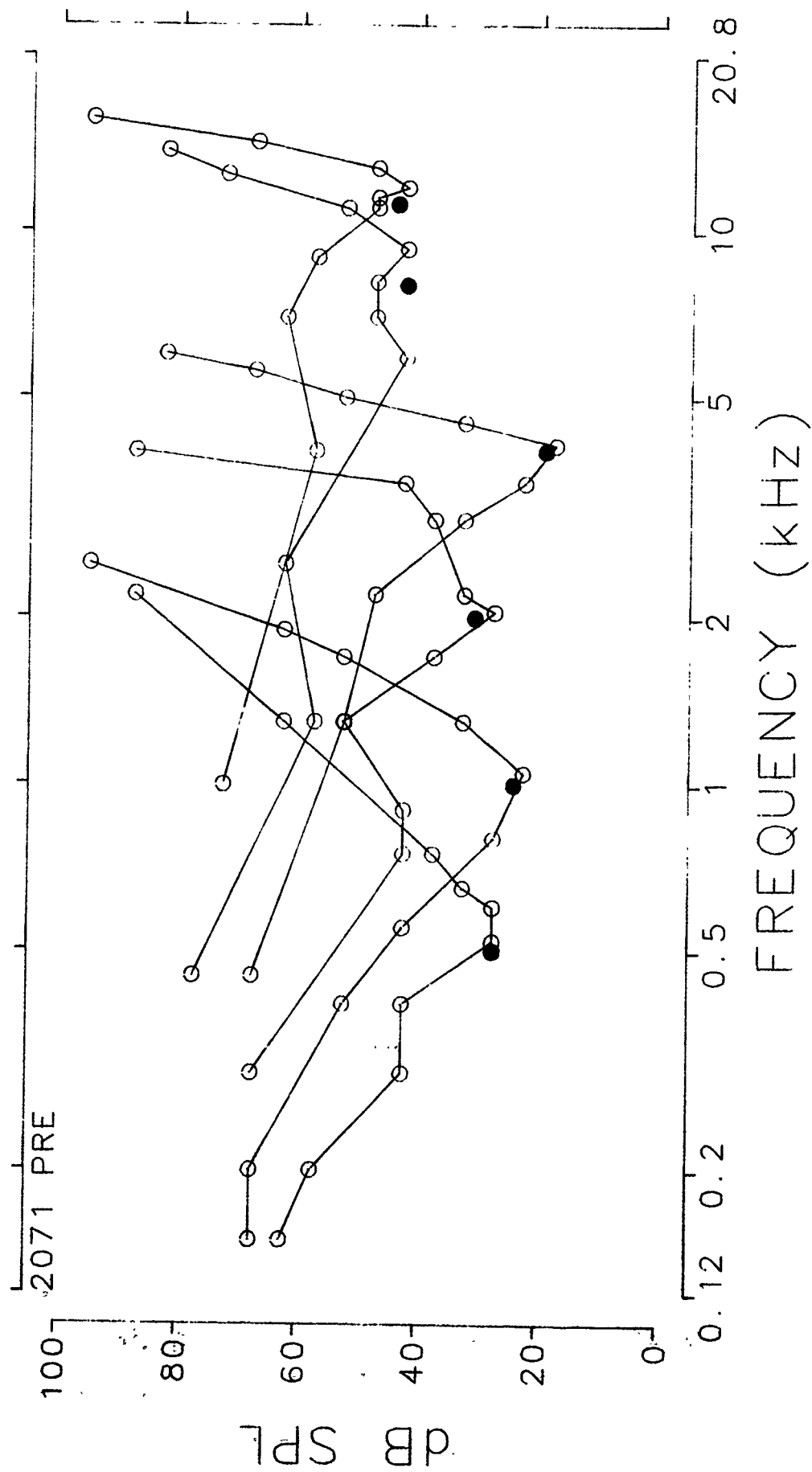
MEAN DATA (n=5) - 150 dB 1X

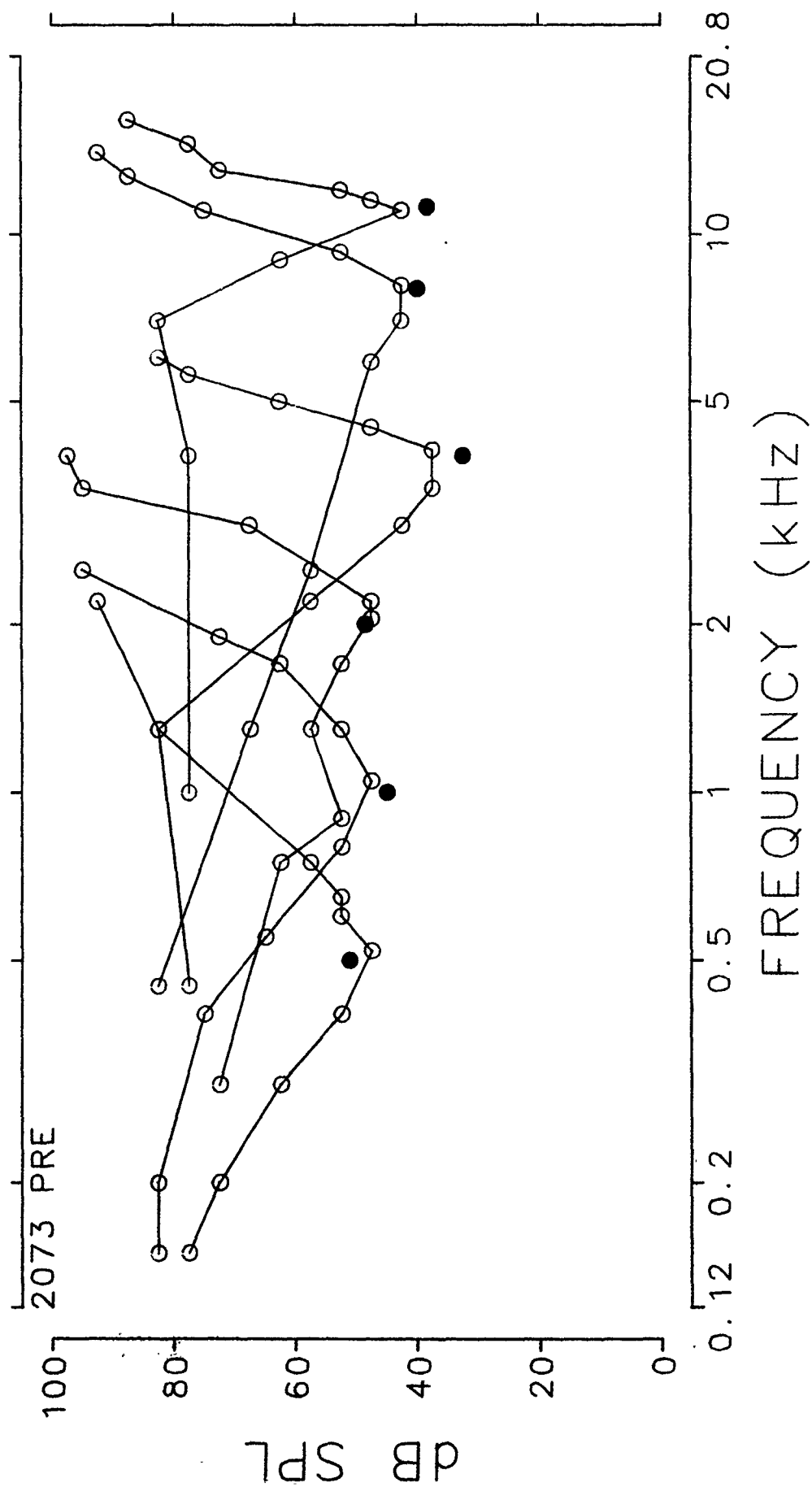


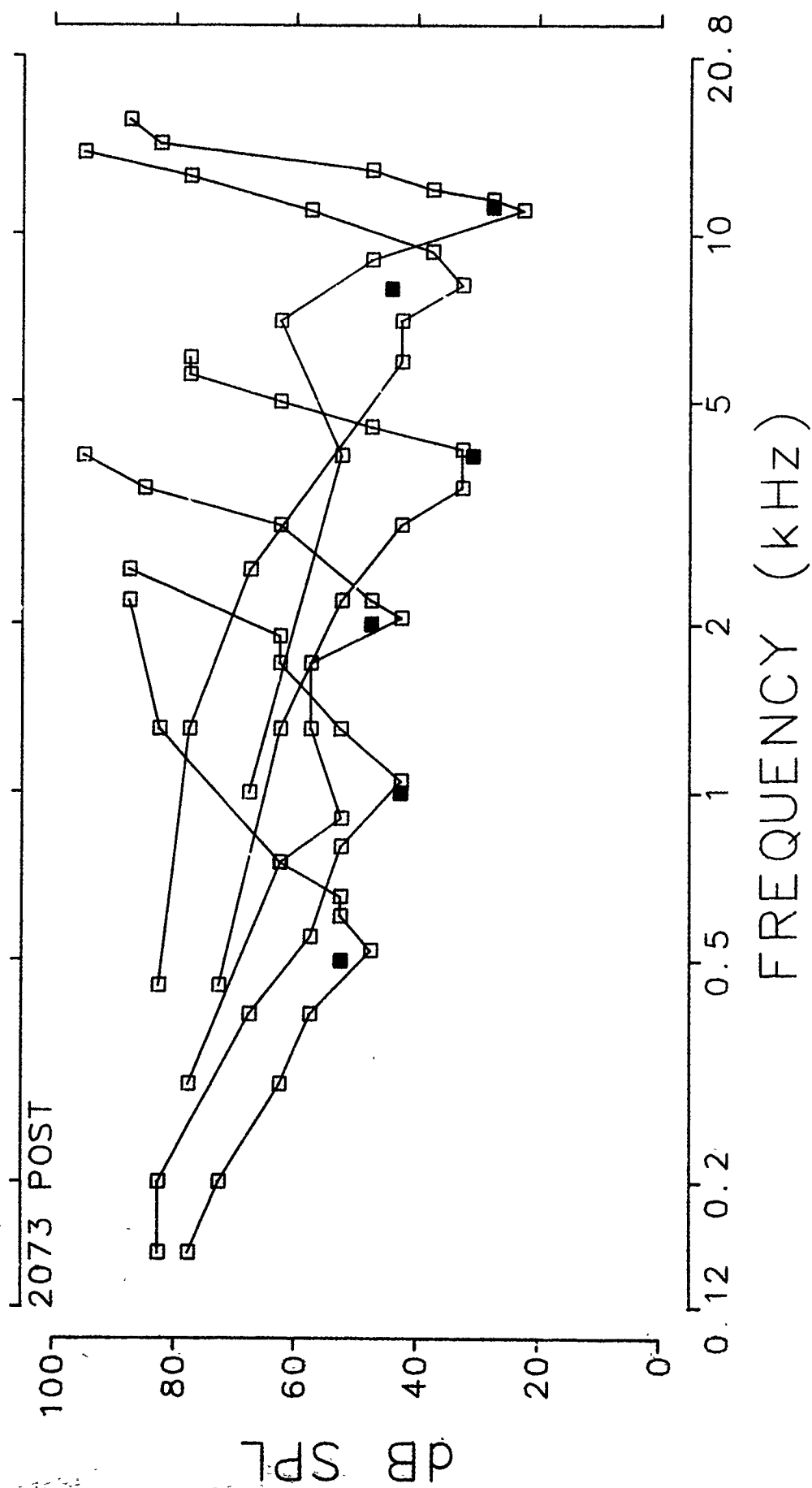
The Pre and Postexposure Tuning Curves for
Individual Animals in this Exposure Group.

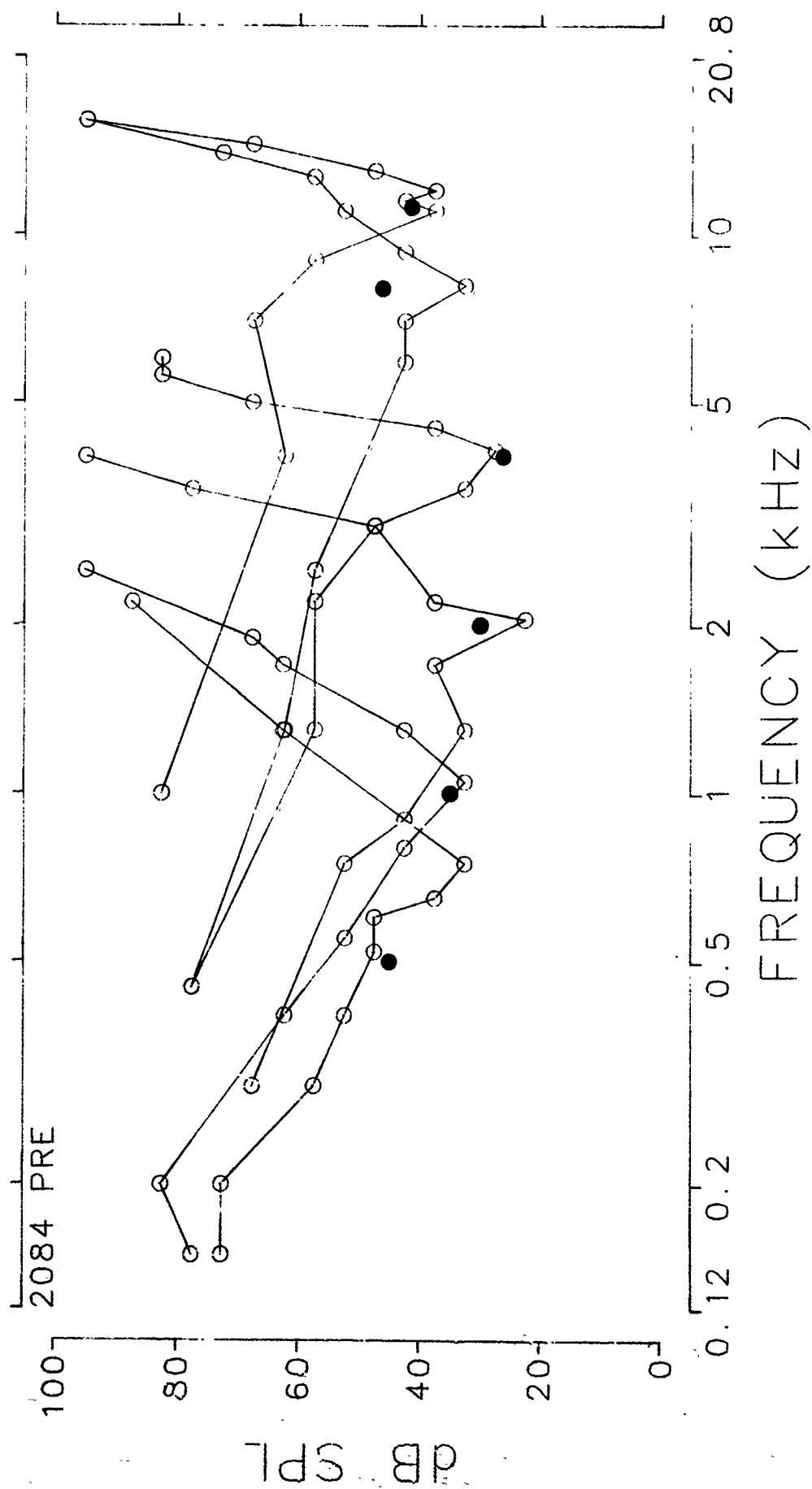
The solid symbol represents the threshold of the probe tone.

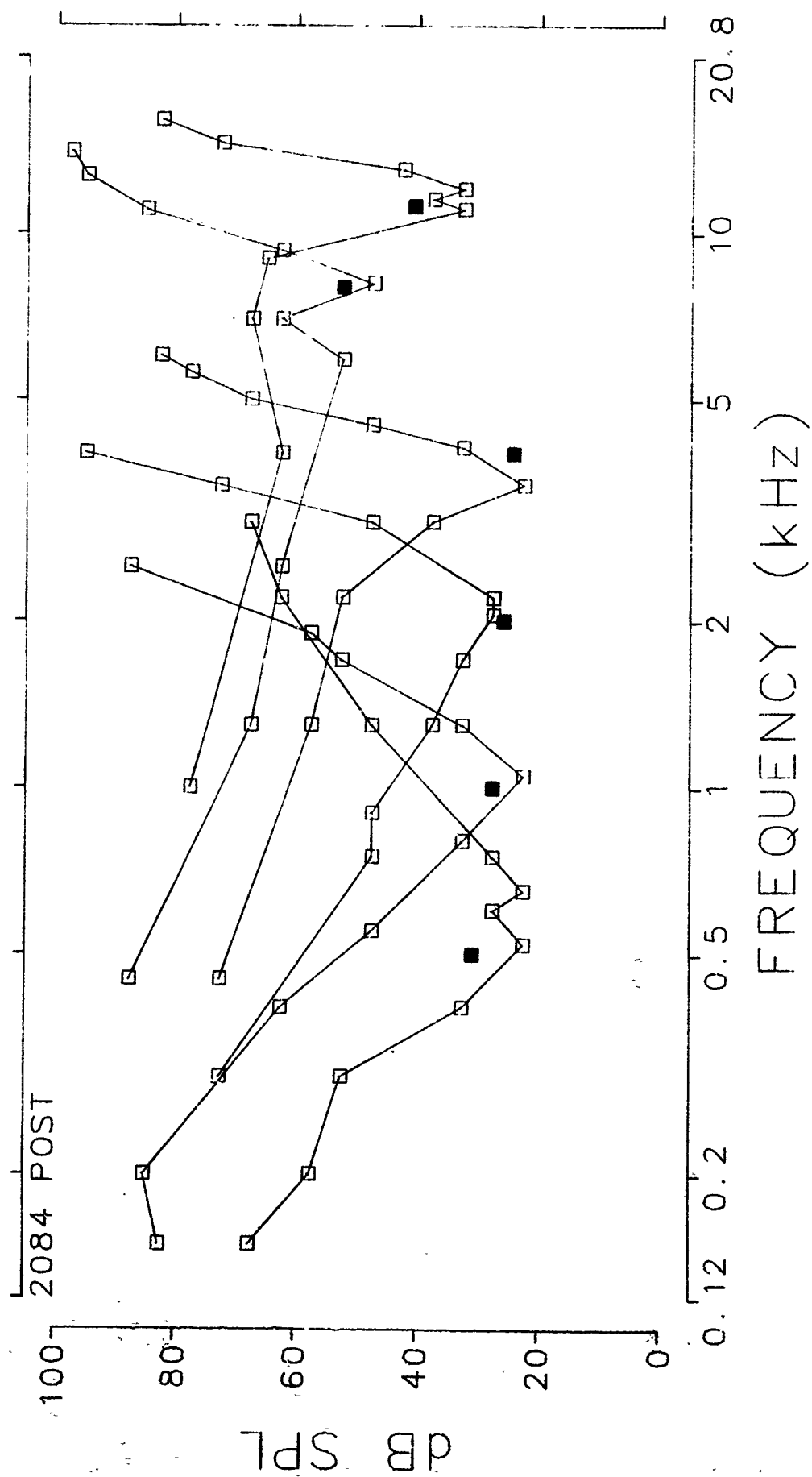












SHOCK TUBE EXPOSURE
150 dB, 1X

TOTAL NUMBER OF COCHLEAR SENSORY CELLS MISSING

| ANIMAL NUMBER | INNER HAIR CELLS | 1ST ROW OUTER HAIR CELLS | 2ND ROW OUTER HAIR CELLS | 3RD ROW OUTER HAIR CELLS | TOTAL OUTER HAIR CELLS |
|------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------------------------|
| R2071R | 11 | 85 | 160 | 170 | 415 |
| R2073R | 41 | 220 | 371 | 265 | 856 |
| R2074R | 11 | 34 | 30 | 69 | 133 |
| R2084R | 37 | 73 | 84 | 71 | 228 |
| R2090R | 17 | 92 | 147 | 234 | 473 |
| GROUP MEAN | 23 | | | | 421 |
| S.D. | 15 | | | | 279 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND LENGTHS OF THE
COCHLEA CENTERED AT THE FREQUENCIES INDICATED

| | OCTAVE BAND CENTER FREQUENCY | INNER HAIR CELLS | OUTER HAIR CELLS |
|-------------|------------------------------------|------------------------|------------------------|
| GROUP MEANS | | | |
| | 0.125 kHz | 2.0 | 137.0 |
| | 0.25 kHz | 2.8 | 42.6 |
| | 0.5 kHz | 4.6 | 64.4 |
| | 1 kHz | 1.4 | 43.4 |
| | 2 kHz | 2.4 | 44.2 |
| | 4 kHz | 6.2 | 51.6 |
| | 8 kHz | 3.2 | 23.8 |
| | 16 kHz | .4 | 13.8 |

STANDARD DEVIATIONS

| | | | |
|--|-----------|-----|-------|
| | 0.125 kHz | 1.9 | 113.1 |
| | 0.25 kHz | 1.5 | 24.5 |
| | 0.5 kHz | 2.9 | 96.0 |
| | 1 kHz | 1.9 | 48.9 |
| | 2 kHz | 2.6 | 46.6 |
| | 4 kHz | 7.1 | 42.9 |
| | 8 kHz | 4.4 | 25.5 |
| | 16 kHz | .5 | 14.8 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R2071R | | | | | | | |
| 0.125 kHz | 3 | 35 | 85 | 111 | 231 | 0 | 0 |
| 0.25 kHz | 2 | 3 | 5 | 33 | 41 | 0 | 0 |
| 0.5 kHz | 5 | 17 | 14 | 5 | 36 | 8 | 5 |
| 1 kHz | 0 | 6 | 6 | 4 | 16 | 0 | 0 |
| 2 kHz | 1 | 4 | 11 | 7 | 22 | 0 | 0 |
| 4 kHz | 0 | 12 | 31 | 2 | 45 | 0 | 1 |
| 8 kHz | 0 | 5 | 6 | 3 | 14 | 0 | 2 |
| 16 kHz | 0 | 2 | 2 | 5 | 9 | 0 | 0 |
| TOTALS | 11 | 85 | 160 | 170 | 415 | 8 | 8 |

CHINCHILLA R2073R

| | | | | | | | |
|-----------|----|-----|-----|-----|-----|---|----|
| 0.125 kHz | 4 | 17 | 22 | 41 | 80 | 2 | 2 |
| 0.25 kHz | 3 | 18 | 22 | 27 | 67 | 0 | 1 |
| 0.5 kHz | 9 | 54 | 115 | 66 | 235 | 0 | 0 |
| 1 kHz | 3 | 29 | 72 | 29 | 130 | 0 | 7 |
| 2 kHz | 7 | 35 | 55 | 35 | 125 | 0 | 1 |
| 4 kHz | 5 | 35 | 45 | 34 | 114 | 0 | 3 |
| 8 kHz | 8 | 21 | 24 | 20 | 65 | 2 | 1 |
| 16 kHz | 0 | 11 | 16 | 13 | 40 | 0 | 3 |
| TOTALS | 41 | 220 | 371 | 265 | 856 | 4 | 18 |

CHINCHILLA R2074R

| | | | | | | | |
|-----------|----|----|----|----|-----|---|---|
| 0.125 kHz | 3 | 3 | 12 | 13 | 28 | 0 | 1 |
| 0.25 kHz | 5 | 5 | 1 | 14 | 20 | 0 | 2 |
| 0.5 kHz | 2 | 1 | 5 | 16 | 22 | 0 | 0 |
| 1 kHz | 0 | 7 | 2 | 13 | 22 | 0 | 0 |
| 2 kHz | 1 | 7 | 2 | 5 | 14 | 0 | 0 |
| 4 kHz | 0 | 5 | 5 | 3 | 13 | 0 | 1 |
| 8 kHz | 0 | 2 | 1 | 2 | 5 | 0 | 0 |
| 16 kHz | 0 | 4 | 2 | 3 | 9 | 0 | 0 |
| TOTALS | 11 | 34 | 30 | 69 | 133 | 0 | 4 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R2084R | | | | | | | |
| 0.125 kHz | 0 | 16 | 19 | 27 | 62 | 0 | 0 |
| 0.25 kHz | 3 | 4 | 1 | 12 | 17 | 0 | 0 |
| 0.5 kHz | 2 | 4 | 17 | 3 | 24 | 0 | 0 |
| 1 kHz | 4 | 9 | 15 | 9 | 33 | 1 | 1 |
| 2 kHz | 2 | 14 | 21 | 8 | 43 | 0 | 1 |
| 4 kHz | 17 | 3 | 5 | 5 | 13 | 0 | 0 |
| 8 kHz | 8 | 19 | 6 | 6 | 31 | 1 | 1 |
| 16 kHz | 1 | 4 | 0 | 1 | 5 | 0 | 0 |
| TOTALS | 37 | 73 | 84 | 71 | 228 | 2 | 3 |
| CHINCHILLA R2090R | | | | | | | |
| 0.125 kHz | 0 | 46 | 108 | 130 | 284 | 0 | 3 |
| 0.25 kHz | 1 | 2 | 6 | 60 | 68 | 0 | 0 |
| 0.5 kHz | 5 | 0 | 2 | 3 | 5 | 0 | 0 |
| 1 kHz | 0 | 7 | 4 | 5 | 16 | 0 | 0 |
| 2 kHz | 1 | 9 | 3 | 5 | 17 | 0 | 0 |
| 4 kHz | 9 | 26 | 17 | 30 | 73 | 21 | 13 |
| 8 kHz | 0 | 0 | 3 | 1 | 4 | 0 | 0 |
| 16 kHz | 1 | 2 | 4 | 0 | 6 | 1 | 0 |
| TOTALS | 17 | 92 | 147 | 234 | 473 | 22 | 16 |

Cochleograms and PTS Audiograms
for Individual Animals

FREQUENCY (KHZ)

0.12 0.2 0.5 1.0 2.0 5.0 10.0 20.8

CHINCHILLA R2073R

— INNER HAIR
--- OUTER HAIR

% CELL LOSS

100
80
60
40
20
0

PTS (db)

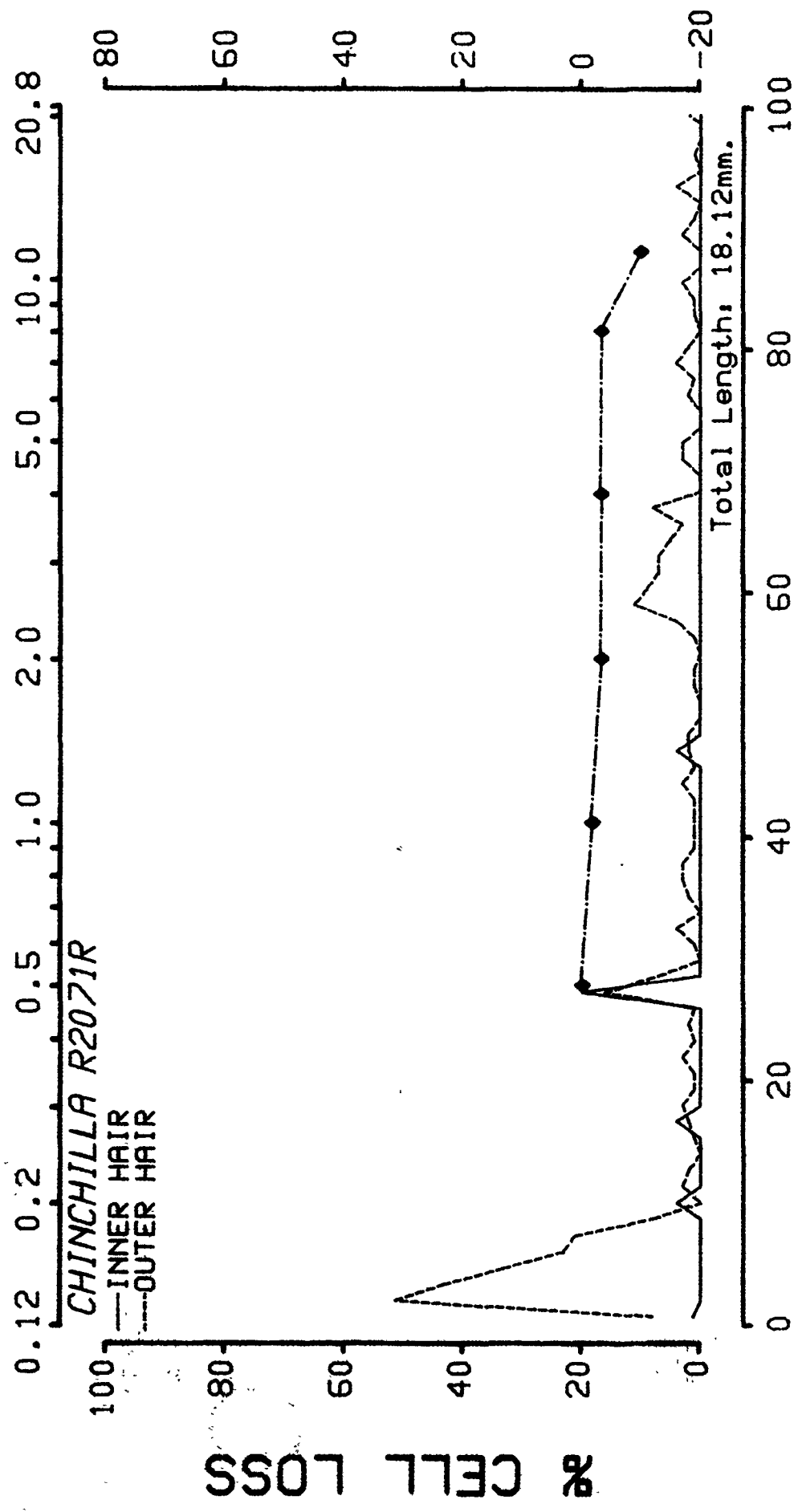
80
60
40
20
0
-20

Total Length: 18.82mm.

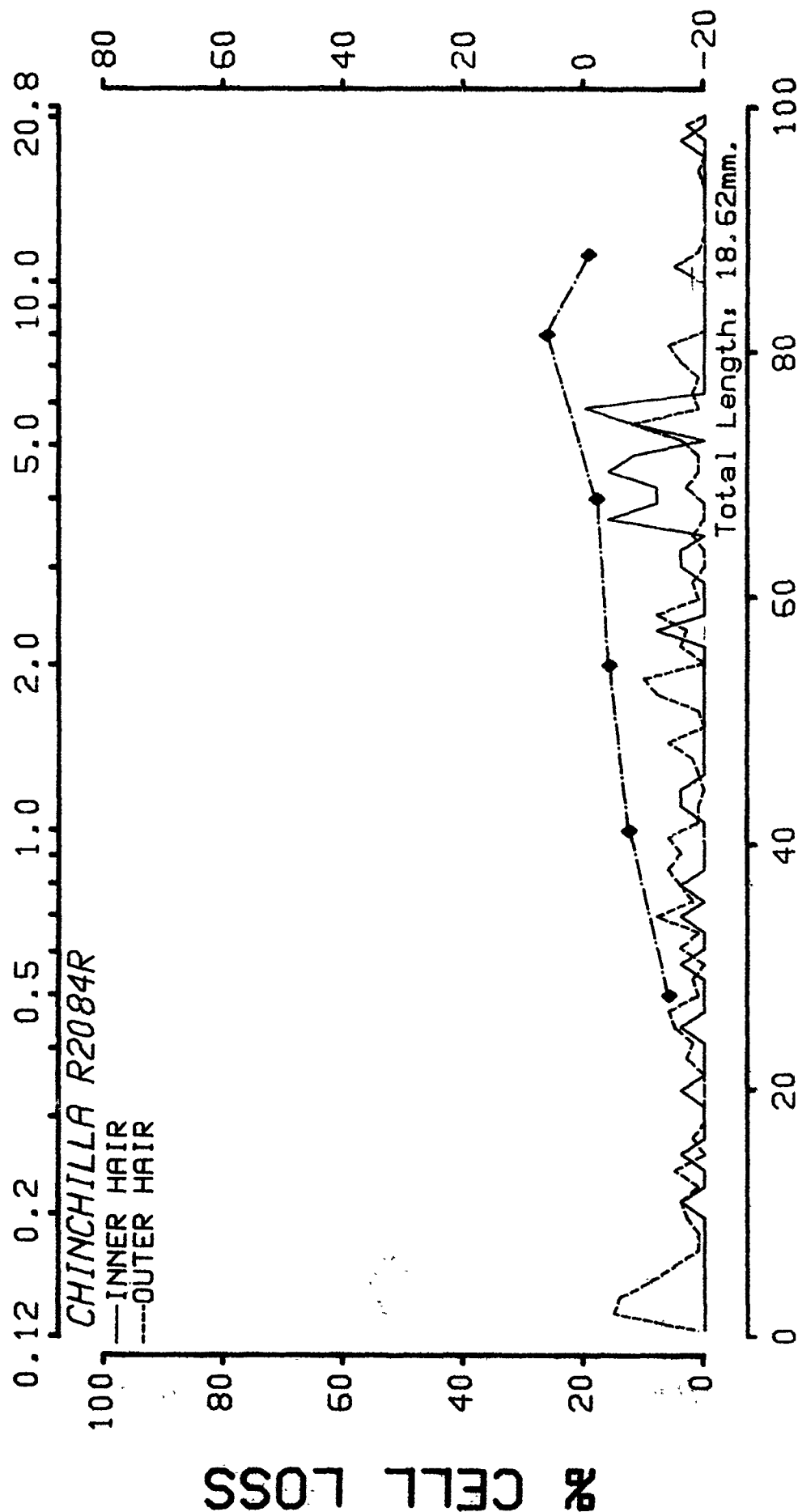
0 20 40 60 80 100

% TOTAL DISTANCE FROM APEX

FREQUENCY (kHz)



FREQUENCY (kHz)

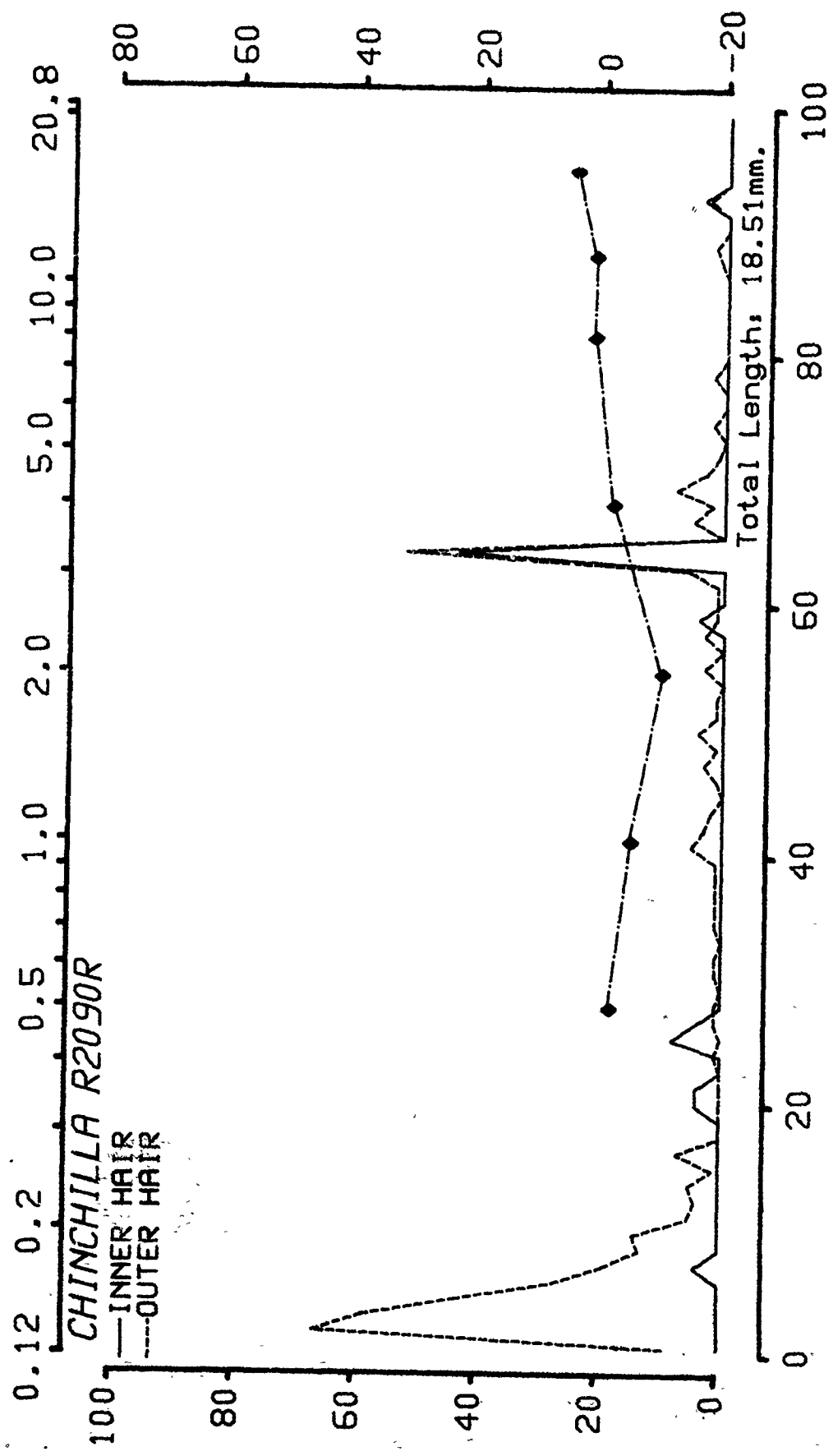


% CELL LOSS

PTS (dB)

% TOTAL DISTANCE FROM APEX

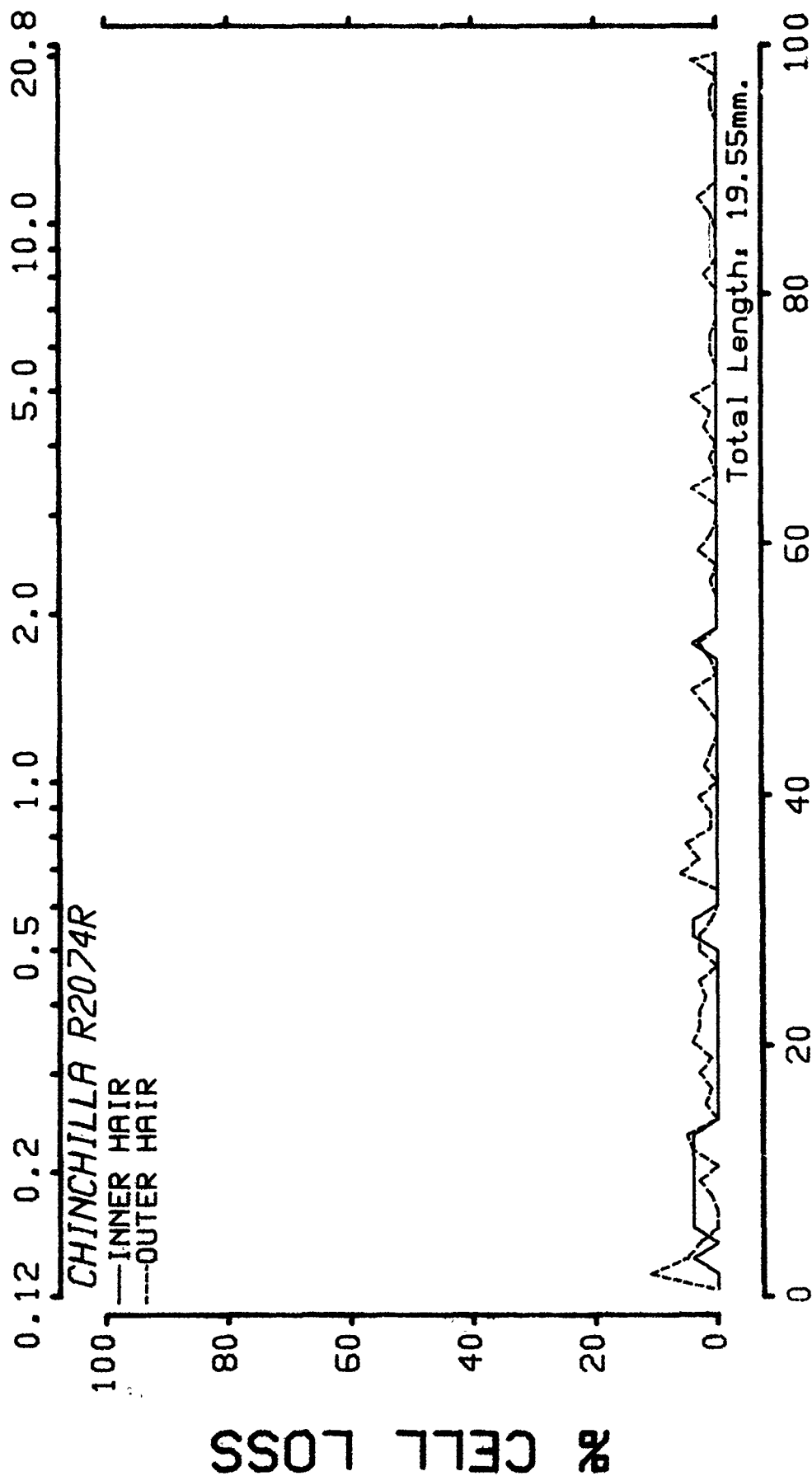
FREQUENCY (kHz)



% CELL LOSS

% TOTAL DISTANCE FROM APEX

FREQUENCY (kHz)



Summary Data for the Group Exposed to:

150 dB, 10X, 1/M

Animal

| | | |
|------|---|-------------------------------|
| 1104 | - | Completed the Entire Protocol |
| 1010 | - | Completed the Entire Protocol |
| 1128 | - | Completed the Entire Protocol |
| 1094 | - | Completed the Entire Protocol |
| 1231 | - | Completed the Entire Protocol |

PRE-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1010 | 3.7 | 0.0 | 5.0 | -8.3 | 8.0 | 13.7 | ***** |
| 1094 | 15.3 | 11.7 | 11.7 | 3.3 | 13.0 | 3.7 | ***** |
| 1104 | 18.7 | 11.7 | 16.7 | 6.7 | 18.0 | 25.3 | ***** |
| 1128 | 20.3 | 8.3 | 11.7 | 6.7 | 9.7 | 15.3 | ***** |
| 1231 | 26.3 | 11.7 | 15.7 | 5.7 | 25.3 | 21.7 | ***** |
| Mean | 16.9 | 8.7 | 12.1 | 2.8 | 14.8 | 15.9 | ***** |
| S.D. | 8.4 | 5.1 | 4.6 | 6.4 | 7.0 | 8.3 | ***** |

POST-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1010 | 15.3 | 6.7 | 13.3 | 0.0 | 18.0 | 17.0 | ***** |
| 1094 | 23.7 | 21.7 | 16.7 | 15.0 | 23.0 | 5.3 | ***** |
| 1104 | 30.3 | 20.0 | 15.0 | 13.3 | 14.7 | 23.7 | ***** |
| 1128 | 15.3 | 10.0 | 6.7 | 11.7 | 21.3 | 13.7 | ***** |
| 1231 | 23.0 | 15.0 | 12.3 | 7.3 | 41.3 | 30.0 | ***** |
| Mean | 21.5 | 14.7 | 12.8 | 9.5 | 23.7 | 17.9 | ***** |
| S.D. | 6.3 | 6.4 | 3.8 | 6.0 | 10.4 | 9.4 | ***** |

PERMANENT THRESHOLD SHIFT (dB)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1010 | 11.7 | 6.7 | 8.3 | 8.3 | 10.0 | 3.3 | ***** |
| 1094 | 8.3 | 10.0 | 5.0 | 11.7 | 10.0 | 1.7 | ***** |
| 1104 | 11.7 | 8.3 | -1.7 | 6.7 | -3.3 | -1.7 | ***** |
| 1128 | -5.0 | 1.7 | -5.0 | 5.0 | 11.7 | -1.7 | ***** |
| 1231 | -3.3 | 3.3 | -3.3 | 1.7 | 16.0 | 8.3 | ***** |
| Mean | 4.7 | 6.0 | 0.7 | 6.7 | 8.9 | 2.0 | ***** |
| S.D. | 8.2 | 3.5 | 5.7 | 3.7 | 7.3 | 4.2 | ***** |

150 dB 10X 1/M

TEMPORARY THRESHOLD SHIFT (dB)

| | | Frequency 0.5 kHz | | | | |
|-----------|------|-------------------|------|------|-------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1010 | 13.3 | 28.3 | 23.3 | 18.3 | 3.3 | 28.3 |
| 1094 | 1.7 | 6.7 | 6.7 | 6.7 | 11.7 | 11.7 |
| 1104 | 13.3 | 23.3 | 18.3 | 13.3 | 13.3 | 23.3 |
| 1128 | 1.7 | 1.7 | 6.7 | 1.7 | -13.3 | 6.7 |
| 1231 | 26.7 | 31.7 | 6.7 | 1.7 | 1.7 | 31.7 |
| Mean | 11.3 | 18.3 | 12.3 | 8.3 | 3.3 | 20.3 |
| S.D. | 10.4 | 13.4 | 7.9 | 7.4 | 10.6 | 10.8 |

| | | Frequency 2.0 kHz | | | | |
|-----------|------|-------------------|------|------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1010 | 55.0 | 35.0 | 35.0 | 25.0 | 0.0 | 55.0 |
| 1094 | 8.3 | 8.3 | 8.3 | 3.3 | 3.3 | 8.3 |
| 1104 | 18.3 | 23.3 | 18.3 | 8.3 | 8.3 | 23.3 |
| 1128 | 13.3 | 18.3 | 13.3 | 13.3 | -6.7 | 18.3 |
| 1231 | 38.3 | 43.3 | 23.3 | 8.3 | 8.3 | 43.3 |
| Mean | 26.7 | 25.7 | 19.7 | 11.7 | 2.7 | 29.7 |
| S.D. | 19.5 | 13.8 | 10.2 | 8.3 | 6.3 | 19.1 |

| | | Frequency 8.0 kHz | | | | |
|-----------|------|-------------------|------|------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1010 | 20.0 | 15.0 | 20.0 | 5.0 | 0.0 | 20.0 |
| 1094 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| 1104 | 15.0 | 5.0 | 0.0 | 0.0 | 0.0 | 15.0 |
| 1128 | 8.3 | 13.3 | 13.3 | 13.3 | 3.3 | 13.3 |
| 1231 | 26.7 | 26.7 | 11.7 | 11.7 | 21.7 | 26.7 |
| Mean | 15.0 | 13.0 | 11.0 | 7.0 | 7.0 | 17.0 |
| S.D. | 8.7 | 8.9 | 7.2 | 5.4 | 9.2 | 6.5 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 10X 1/M

Probe Frequency: 0.5 kHz

| Masker (kHz): | 0.150 | 0.200 | 0.300 | 0.400 | 0.520 | 0.600 | 0.650 | 0.750 | 1.300 | 2.200 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1010 (1.53) | 57.0 | 32.0 | 17.0 | 16.0 | 28.0 | 31.0 | 43.0 | 48.0 | 64.0 | 71.0 |
| 1094 (1.09) | 62.0 | 52.0 | 37.0 | 31.0 | 33.0 | 36.0 | 43.0 | 43.0 | 54.0 | 71.0 |
| 1104 (1.02) | 57.0 | 52.0 | 37.0 | 36.0 | 28.0 | 26.0 | 28.0 | 28.0 | 44.0 | 66.0 |
| 1128 (1.96) | 77.0 | 67.0 | 47.0 | 41.0 | 33.0 | 36.0 | 48.0 | 58.0 | 69.0 | 94.0* |
| 1231 (1.08) | 64.0 | 58.0 | 47.0 | 42.0 | 34.0 | 36.0 | 39.0 | 39.0 | 64.0 | 96.0* |
| Mean | (1.34) | 52.2 | 37.0 | 33.2 | 31.2 | 33.0 | 40.2 | 43.2 | 59.0 | 79.6 |
| S.D. | (0.40) | 12.9 | 12.2 | 10.6 | 2.9 | 4.5 | 7.5 | 11.1 | 10.0 | 14.2 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1010 (2.12) | 67.0 | 67.0 | 47.0 | 41.0 | 33.0 | 41.0 | 53.0 | 53.0 | 92.0* | 94.0* |
| 1094 (2.31) | 62.0 | 52.0 | 32.0 | 31.0 | 18.0 | 21.0 | 28.0 | 33.0 | 49.0 | 86.0 |
| 1104 (2.31) | 57.0 | 57.0 | 47.0 | 36.0 | 23.0 | 31.0 | 33.0 | 38.0 | 59.0 | 71.0 |
| 1128 (1.00) | 52.0 | 42.0 | 27.0 | 21.0 | 23.0 | 21.0 | 28.0 | 43.0 | 49.0 | 56.0 |
| 1231 (1.51) | 59.0 | 48.0 | 32.0 | 27.0 | 24.0 | 26.0 | 39.0 | 49.0 | 59.0 | 68.0 |
| Mean | (1.85) | 53.2 | 37.0 | 31.2 | 24.2 | 28.0 | 36.2 | 43.2 | 61.6 | 75.0 |
| S.D. | (0.58) | 9.5 | 9.4 | 7.8 | 5.4 | 8.4 | 10.4 | 8.1 | 17.7 | 15.1 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 10X 1/M

Probe Frequency: 1.0 kHz

| Masker (kHz): | 0.150 | 0.200 | 0.400 | 0.550 | 0.800 | 1.050 | 1.300 | 1.700 | 1.900 | 2.500 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1010 (4.13) | 82.0 | 72.0 | 61.0 | 53.0 | 48.0 | 19.0 | 34.0 | 57.0 | 90.0* | 94.0* |
| 1094 (2.41) | 52.0 | 47.0 | 46.0 | 33.0 | 28.0 | 14.0 | 24.0 | 32.0 | 47.0 | 51.0 |
| 1104 (2.33) | 77.0 | 77.0 | 56.0 | 63.0 | 28.0 | 24.0 | 29.0 | 37.0 | 52.0 | 86.0 |
| 1128 (2.41) | 82.0 | 77.0 | 51.0 | 43.0 | 28.0 | 14.0 | 24.0 | 42.0 | 52.0 | 81.0 |
| 1231 (1.54) | 69.0 | 68.0 | 62.0 | 48.0 | 28.0 | 27.0 | 34.0 | 52.0 | 55.0 | 86.0 |
| Mean (2.36) | 72.4 | 68.2 | 55.2 | 48.0 | 32.0 | 19.6 | 29.0 | 44.0 | 59.2 | 79.6 |
| S.D. (1.10) | 12.6 | 12.4 | 6.8 | 11.2 | 8.9 | 5.9 | 5.0 | 10.4 | 17.5 | 16.7 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1010 (1.84) | 77.0 | 62.0 | 56.0 | 38.0 | 28.0 | 24.0 | 39.0 | 87.0 | 90.0* | 94.0* |
| 1094 (0.97) | 77.0 | 67.0 | 51.0 | 43.0 | 23.0 | 24.0 | 29.0 | 37.0 | 42.0 | 56.0 |
| 1104 (1.79) | 77.0 | 72.0 | 51.0 | 48.0 | 28.0 | 24.0 | 34.0 | 42.0 | 52.0 | 94.0* |
| 1128 (2.71) | 82.0 | 77.0 | 61.0 | 43.0 | 28.0 | 19.0 | 39.0 | 47.0 | 57.0 | 86.0 |
| 1231 (1.35) | 74.0 | 63.0 | 52.0 | 48.0 | 38.0 | 32.0 | 34.0 | 52.0 | 60.0 | 76.0 |
| Mean (1.73) | 77.4 | 68.2 | 54.2 | 44.0 | 29.0 | 24.6 | 35.0 | 53.0 | 60.2 | 81.2 |
| S.D. (0.65) | 2.9 | 6.3 | 4.3 | 4.2 | 5.5 | 4.7 | 4.2 | 19.8 | 18.0 | 15.9 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 10X 1/M

Probe Frequency: 2.0 kHz

Masker (kHz): 0.300 0.750 0.900 1.300 1.700 2.050 2.200 3.000 3.500 4.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|-------|------|------|------|------|------|------|------|------|-------|
| 1010 (10.57) | 72.0 | 58.0 | 44.0 | 49.0 | 42.0 | 11.0 | 31.0 | 36.0 | 59.0 | 81.0 |
| 1094 (0.83) | 52.0 | 48.0 | 44.0 | 37.0 | 42.0 | 36.0 | 36.0 | 41.0 | 49.0 | 66.0 |
| 1104 (2.70) | 72.0 | 53.0 | 44.0 | 39.0 | 27.0 | 26.0 | 41.0 | 46.0 | 54.0 | 89.0* |
| 1128 (6.31) | 80.0* | 48.0 | 39.0 | 44.0 | 42.0 | 21.0 | 31.0 | 36.0 | 44.0 | 56.0 |
| 1231 (4.99) | 62.0 | 49.0 | 53.0 | 39.0 | 37.0 | 25.0 | 38.0 | 45.0 | 51.0 | 52.0 |

| | | | | | | | | | | |
|-------------|------|------|------|------|------|------|------|------|------|------|
| Mean (5.08) | 67.6 | 51.2 | 44.8 | 41.6 | 38.0 | 23.8 | 35.4 | 40.8 | 51.4 | 68.8 |
| S.D. (3.72) | 10.8 | 4.5 | 5.1 | 4.9 | 6.5 | 9.0 | 4.4 | 4.8 | 5.6 | 15.9 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|-------------|------|------|------|------|------|------|------|------|------|-------|
| 1010 (6.31) | 57.0 | 58.0 | 54.0 | 54.0 | 42.0 | 26.0 | 41.0 | 56.0 | 59.0 | 61.0 |
| 1094 (1.53) | 67.0 | 43.0 | 34.0 | 29.0 | 32.0 | 26.0 | 36.0 | 41.0 | 59.0 | 71.0 |
| 1104 (2.53) | 67.0 | 38.0 | 34.0 | 29.0 | 17.0 | 16.0 | 26.0 | 31.0 | 34.0 | 46.0 |
| 1128 (0.70) | 32.0 | 33.0 | 24.0 | 24.0 | 17.0 | 16.0 | 16.0 | 16.0 | 19.0 | 31.0 |
| 1231 (7.40) | 62.0 | 69.0 | 58.0 | 54.0 | 37.0 | 20.0 | 43.0 | 60.0 | 91.0 | 90.0* |

| | | | | | | | | | | |
|-------------|------|------|------|------|------|------|------|------|------|------|
| Mean (3.70) | 57.0 | 46.2 | 40.8 | 38.0 | 29.0 | 20.8 | 32.4 | 40.8 | 52.4 | 59.8 |
| S.D. (2.98) | 14.6 | 14.9 | 14.5 | 14.7 | 11.5 | 5.0 | 11.3 | 18.1 | 27.5 | 22.7 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 10X 1/M

Probe Frequency: 4.0 kHz

Masker (kHz): 0.450 1.300 2.200 3.000 3.500 4.100 4.500 5.000 5.600 6.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| 1010 (7.26) | 63.0 | 59.0 | 56.0 | 41.0 | 29.0 | 5.0 | 18.0 | 31.0 | 48.0 | 67.0 |
| 7394 (2.58) | 73.0 | 54.0 | 51.0 | 26.0 | 24.0 | 15.0 | 23.0 | 26.0 | 38.0 | 57.0 |
| 1104 (4.83) | 78.0 | 59.0 | 61.0 | 41.0 | 24.0 | 15.0 | 33.0 | 41.0 | 53.0 | 72.0 |
| 1128 (2.82) | 78.0 | 64.0 | 61.0 | 36.0 | 24.0 | 29.0 | 38.0 | 41.0 | 53.0 | 72.0 |
| 1231 (5.55) | 58.0 | 59.0 | 53.0 | 40.0 | 26.0 | 10.0 | 23.0 | 33.0 | 44.0 | 47.0 |

| | | | | | | | | | | | |
|------|---------|------|------|------|------|------|------|------|------|------|------|
| Mean | (4.69) | 70.0 | 59.0 | 56.4 | 36.8 | 25.4 | 14.8 | 27.0 | 34.4 | 47.2 | 63.0 |
| S.D. | (2.01) | 9.1 | 3.5 | 4.6 | 6.4 | 2.2 | 9.0 | 8.2 | 6.5 | 6.4 | 10.8 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| 1010 (2.21) | 73.0 | 69.0 | 56.0 | 36.0 | 24.0 | 25.0 | 33.0 | 36.0 | 43.0 | 72.0 |
| 1094 (3.63) | 78.0 | 54.0 | 46.0 | 31.0 | 19.0 | 30.0 | 33.0 | 41.0 | 43.0 | 72.0 |
| 1104 (3.52) | 83.0 | 59.0 | 56.0 | 41.0 | 29.0 | 20.0 | 28.0 | 36.0 | 43.0 | 62.0 |
| 1128 (3.53) | 68.0 | 49.0 | 46.0 | 31.0 | 29.0 | 20.0 | 33.0 | 41.0 | 58.0 | 87.0 |
| 1231 (2.81) | 58.0 | 49.0 | 43.0 | 35.0 | 26.0 | 35.0 | 48.0 | 53.0 | 59.0 | 72.0 |

| | | | | | | | | | | | |
|------|---------|------|------|------|------|------|------|------|------|------|------|
| Mean | (3.14) | 72.0 | 56.0 | 49.4 | 34.8 | 25.4 | 26.0 | 35.0 | 41.4 | 49.2 | 73.0 |
| S.D. | (0.61) | 9.6 | 3.4 | 6.1 | 4.1 | 4.2 | 6.5 | 7.6 | 6.9 | 8.5 | 8.9 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 10X 1/M

Probe Frequency: 8.0 kHz

| Masker (kHz): | 9.450 | 1.300 | 2.500 | 5.900 | 7.000 | 8.100 | 9.300 | 11.000 | 12.700 | 14.000 |
|------------------|--------------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1010 (8.91) | 63.0 | 74.0 | 71.0 | 38.0 | **** | 30.0 | 43.0 | 67.0 | 88.0* | 85.0* |
| 1094 (4.38) | 78.0 | 59.0 | 56.0 | 43.0 | 47.0 | 25.0 | 33.0 | 57.0 | 70.0 | 85.0* |
| 1104 (2.87) | 88.0 | 64.0 | 61.0 | 48.0 | 37.0 | 35.0 | 48.0 | 72.0 | 80.0 | 85.0* |
| 1120 (5.15) | 68.0 | 54.0 | 56.0 | 48.0 | 37.0 | 20.0 | 33.0 | 52.0 | 60.0 | 62.0 |
| 1231 (3.91) | 68.0 | 59.0 | 56.0 | 48.0 | 43.0 | 25.0 | 31.0 | 57.0 | 66.0 | 72.0 |
| Mean (5.04) | 77.0 | 62.0 | 60.0 | 45.0 | 41.0 | 27.0 | 37.6 | 61.0 | 72.8 | 77.8 |
| S.D. (2.32) | 8.9 | 7.6 | 6.5 | 4.5 | 4.9 | 5.7 | 7.5 | 8.2 | 11.2 | 10.5 |

| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
|------------------|---------------|-------|-------|-------|------|------|------|-------|-------|-------|
| 1010 (7.53) | 58.0 | 49.0 | 46.0 | 28.0 | 32.0 | 15.0 | 43.0 | 57.0 | 75.0 | 85.0* |
| 1094 (1.20) | 78.0 | 59.0 | 26.0 | 43.0 | 37.0 | 40.0 | 43.0 | 47.0 | 65.0 | 85.0* |
| 1104 (4.41) | 73.0 | 54.0 | 46.0 | 38.0 | 32.0 | 20.0 | 33.0 | 47.0 | 50.0 | 57.0 |
| 1128 (5.68) | 72.0 | 74.0 | 71.0 | 58.0 | 52.0 | 30.0 | 43.0 | 72.0 | 75.0 | 85.0* |
| 1231 (2.85) | 91.0* | 92.0* | 94.0* | 91.0* | 68.0 | 70.0 | 81.0 | 95.0* | 89.0* | 90.0* |
| Mean (4.33) | 75.6 | 65.6 | 56.6 | 51.6 | 44.2 | 35.0 | 48.6 | 63.6 | 70.8 | 80.4 |
| S.D. (2.45) | 11.9 | 17.5 | 26.3 | 24.5 | 15.6 | 21.8 | 18.6 | 20.3 | 14.4 | 13.3 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 10X 1/M

Probe Frequency: 11.2 kHz

Masker (kHz): 1.000 4.000 7.000 9.000 11.000 11.500 12.000 13.000 14.500 16.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|-------|------|------|------|------|------|------|------|------|
| 1010 (2.83) | 69.0 | **** | 62.0 | 35.0 | 27.0 | 25.0 | 35.0 | 51.0 | 61.0 | 74.9 |
| 1094 (9.52) | 64.0 | ***** | 62.0 | 40.0 | 12.0 | 25.0 | 25.0 | 36.0 | 51.0 | 64.0 |
| 1104 (4.70) | 64.0 | ***** | 67.0 | 50.0 | 32.0 | 35.0 | 30.0 | 46.0 | 56.0 | 69.0 |
| 1128 (3.44) | 69.0 | ***** | 57.0 | 45.0 | 32.0 | 35.0 | 35.0 | 46.0 | 51.0 | 79.0 |
| 1231 (9.37) | 51.0 | ***** | 43.0 | 39.0 | 37.0 | 22.0 | 24.0 | 44.0 | 57.0 | 66.0 |

| | | | | | | | | | | |
|--------------|------|-------|------|------|------|------|------|------|------|------|
| Mean (6.19) | 63.4 | ***** | 58.2 | 41.8 | 28.0 | 28.4 | 29.8 | 44.6 | 55.2 | 70.4 |
| S.D. (3.05) | 7.4 | ***** | 9.2 | 5.8 | 9.6 | 6.1 | 5.3 | 5.5 | 4.3 | 6.1 |

Animal (Q-10 dB)

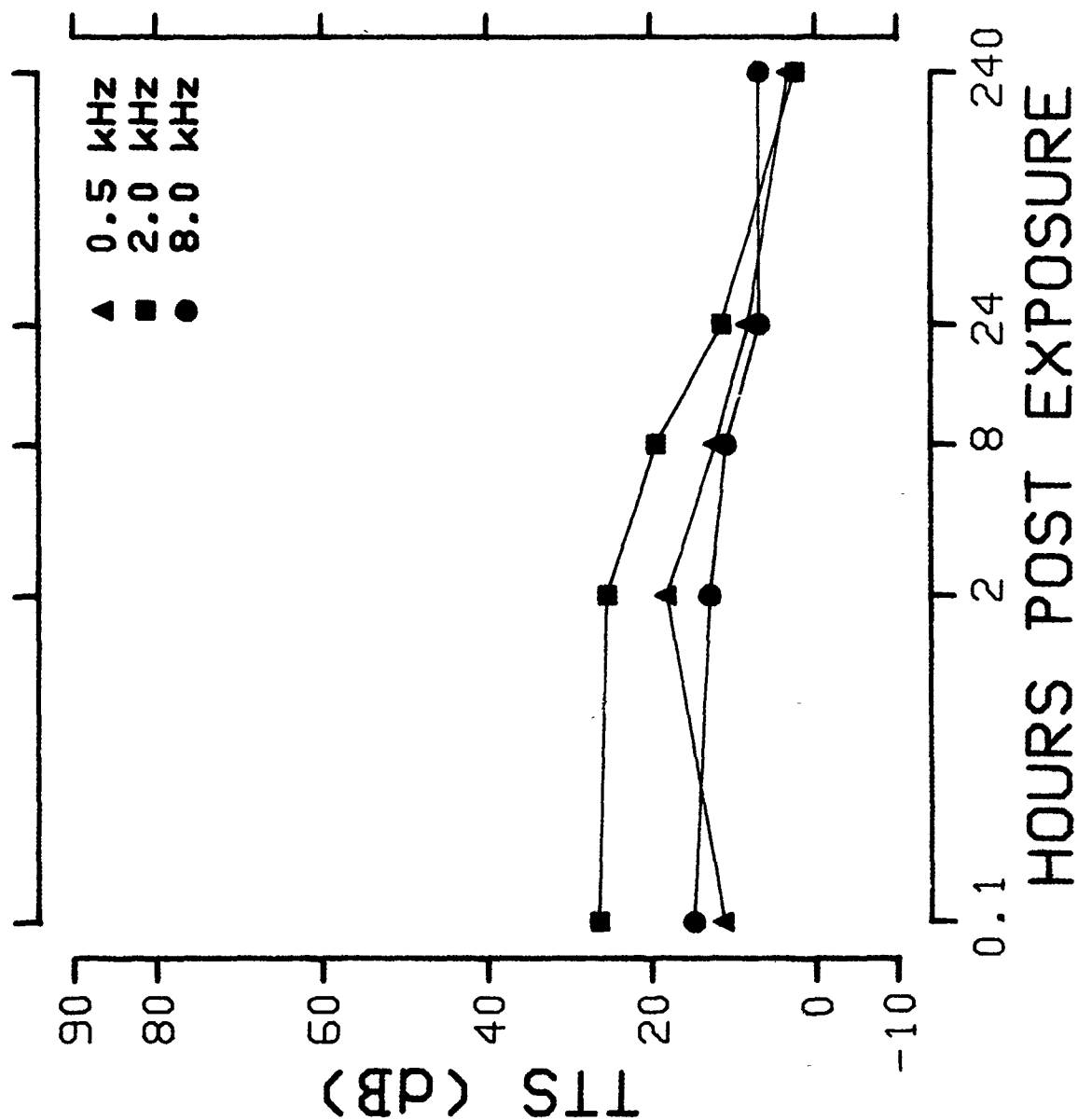
Post-Exposure

| | | | | | | | | | | |
|--------------|------|-------|------|------|------|------|------|------|------|------|
| 1010 (3.16) | 69.0 | ***** | 37.0 | 20.0 | 12.0 | 20.0 | 15.0 | 46.0 | 51.0 | 54.0 |
| 1094 (3.95) | 74.0 | ***** | 62.0 | 40.0 | 22.0 | 25.0 | 25.0 | 36.0 | 51.0 | 69.0 |
| 1104 (4.60) | 64.0 | ***** | 52.0 | 45.0 | 32.0 | 20.0 | 20.0 | 26.0 | 36.0 | 44.0 |
| 1128 (4.22) | 59.0 | ***** | 52.0 | 40.0 | 22.0 | 25.0 | 20.0 | 31.0 | 36.0 | 44.0 |
| 1231 (8.46) | 71.0 | ***** | 63.0 | 59.0 | 52.0 | 37.0 | 39.0 | 54.0 | 57.0 | 66.0 |

| | | | | | | | | | | |
|--------------|------|-------|------|------|------|------|------|------|------|------|
| Mean (4.88) | 67.4 | ***** | 53.2 | 40.8 | 28.0 | 25.4 | 23.8 | 38.6 | 46.2 | 55.4 |
| S.D. (2.07) | 5.9 | ***** | 10.5 | 14.0 | 15.2 | 6.9 | 9.2 | 11.3 | 9.6 | 11.8 |

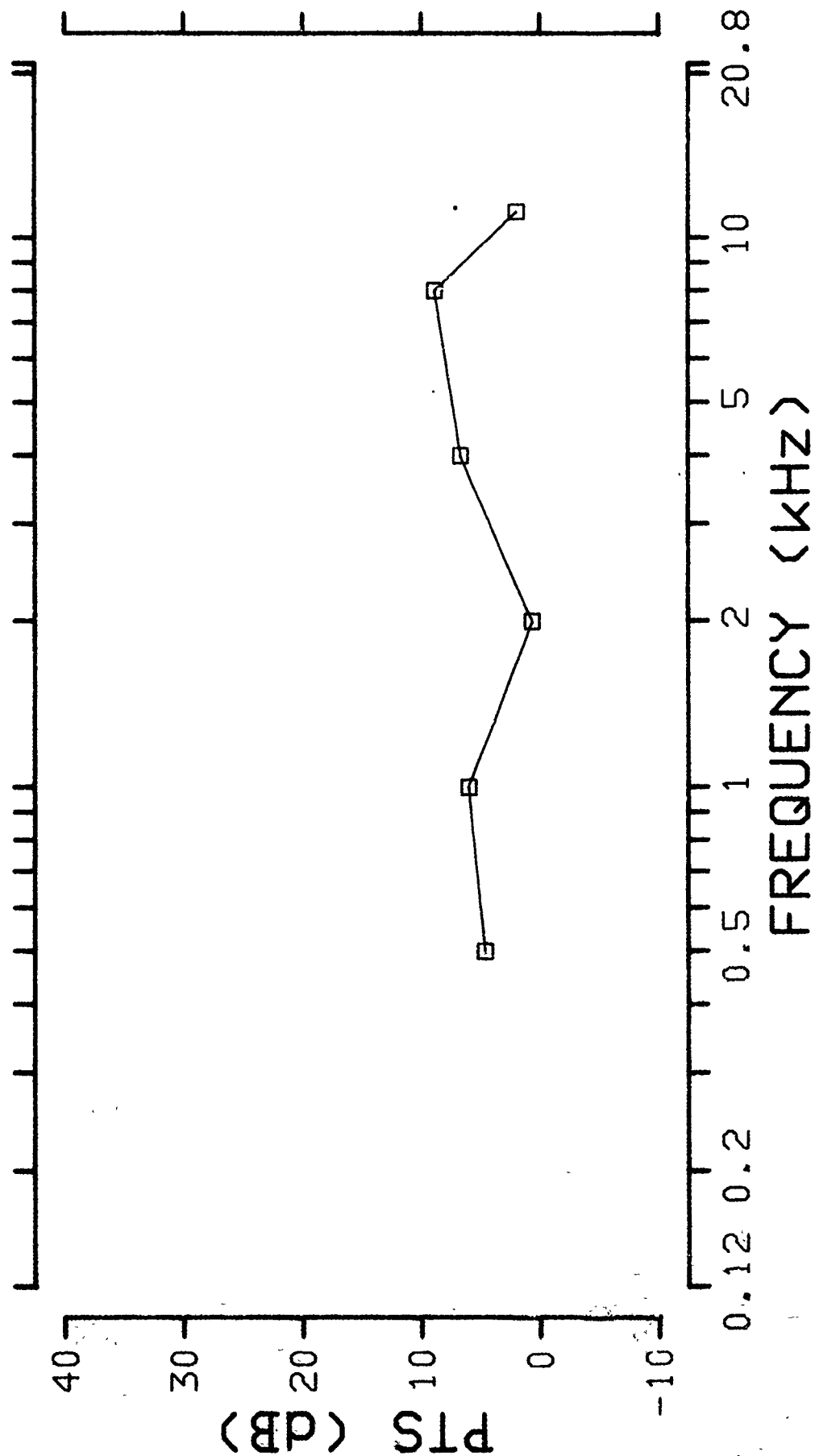
**The Group Mean Recovery Curves
Measured at Three Test Frequencies**

MEAN DATA (n=5) - 150 dB 10X 1/M



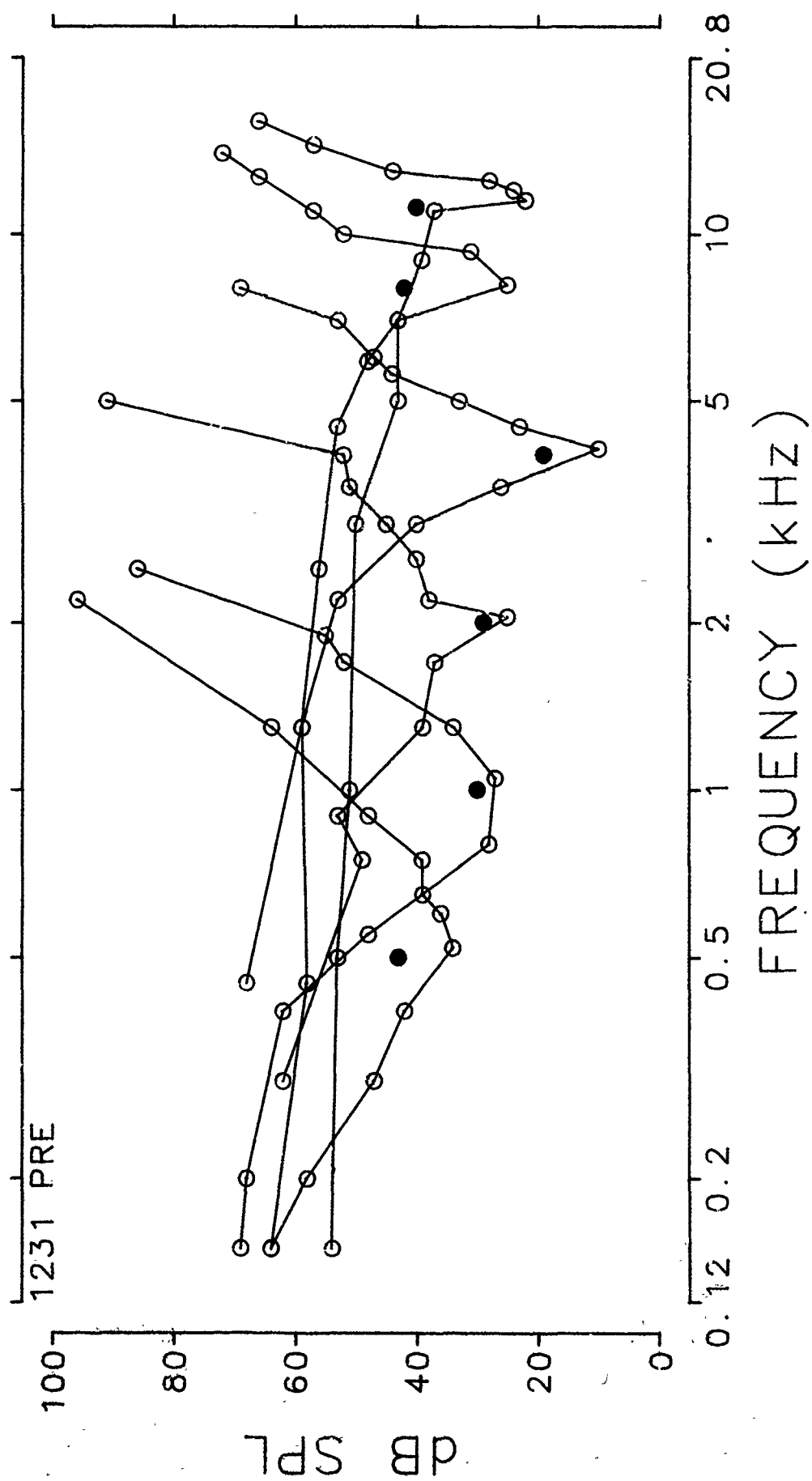
The Group Mean Permanent Threshold Shift (PTS)
for all Test Frequencies

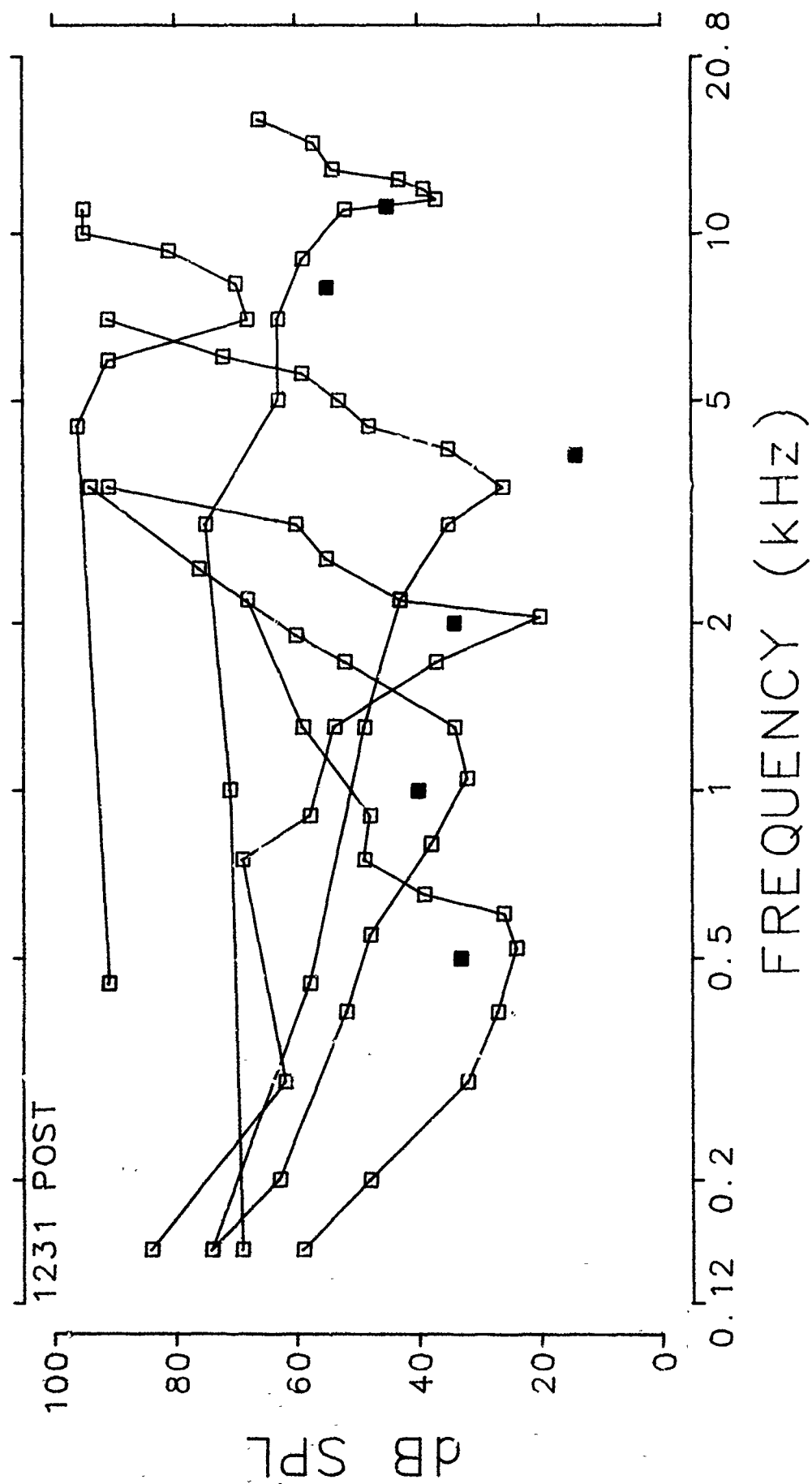
MEAN DATA (n=5) - 150 dB 10X 1/M

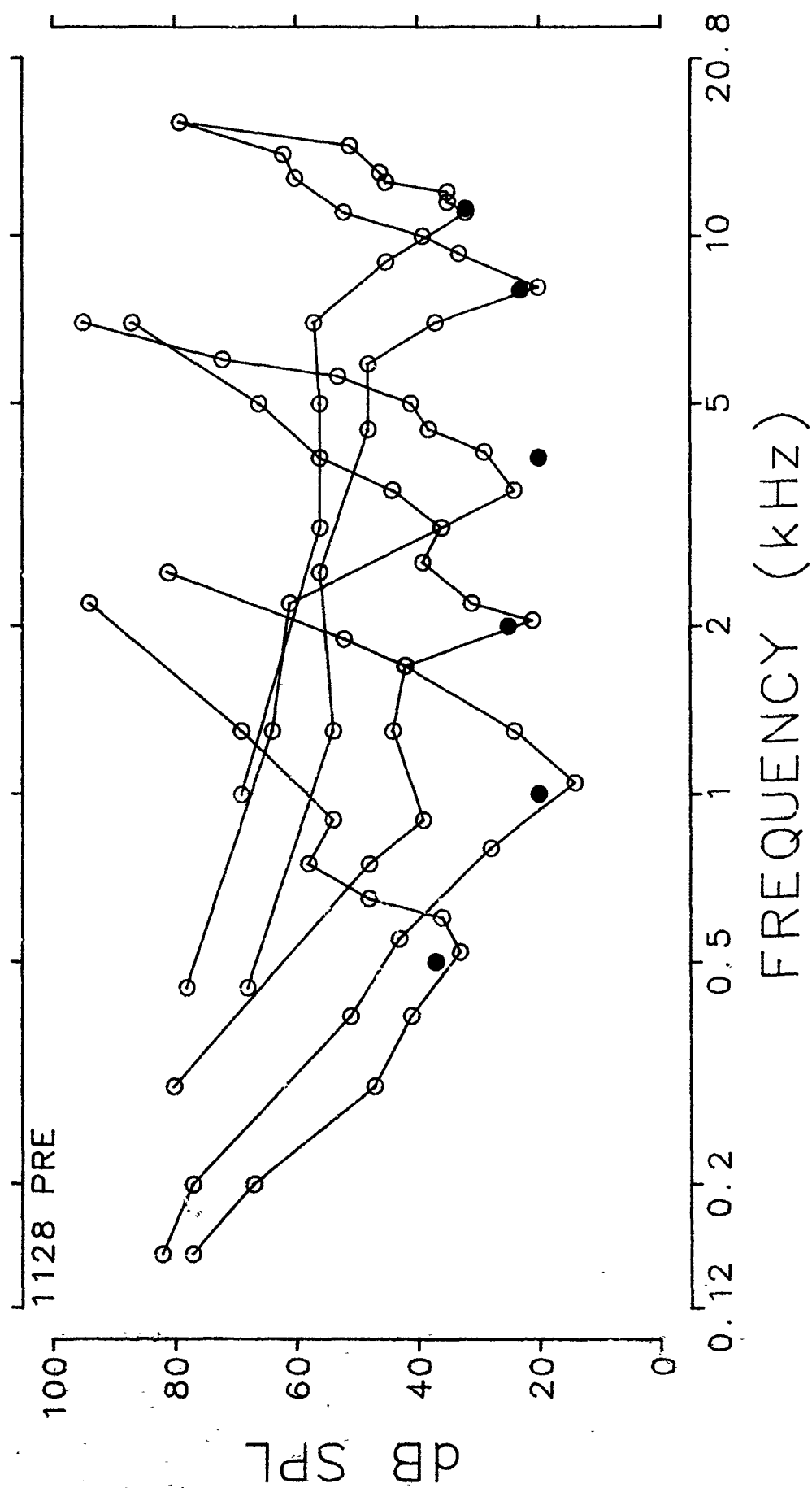


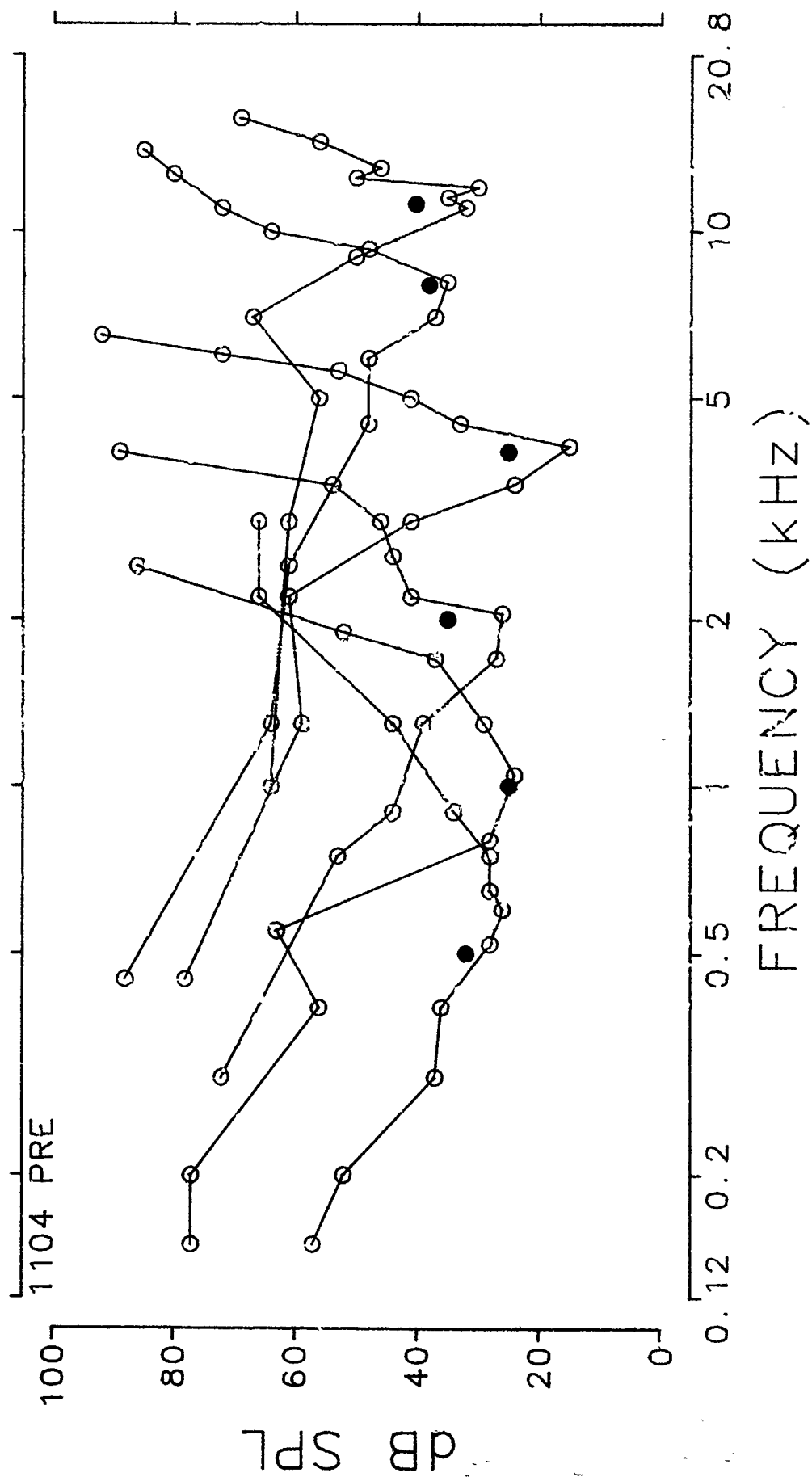
The Pre and Postexposure Tuning Curves for
Individual Animals in this Exposure Group.

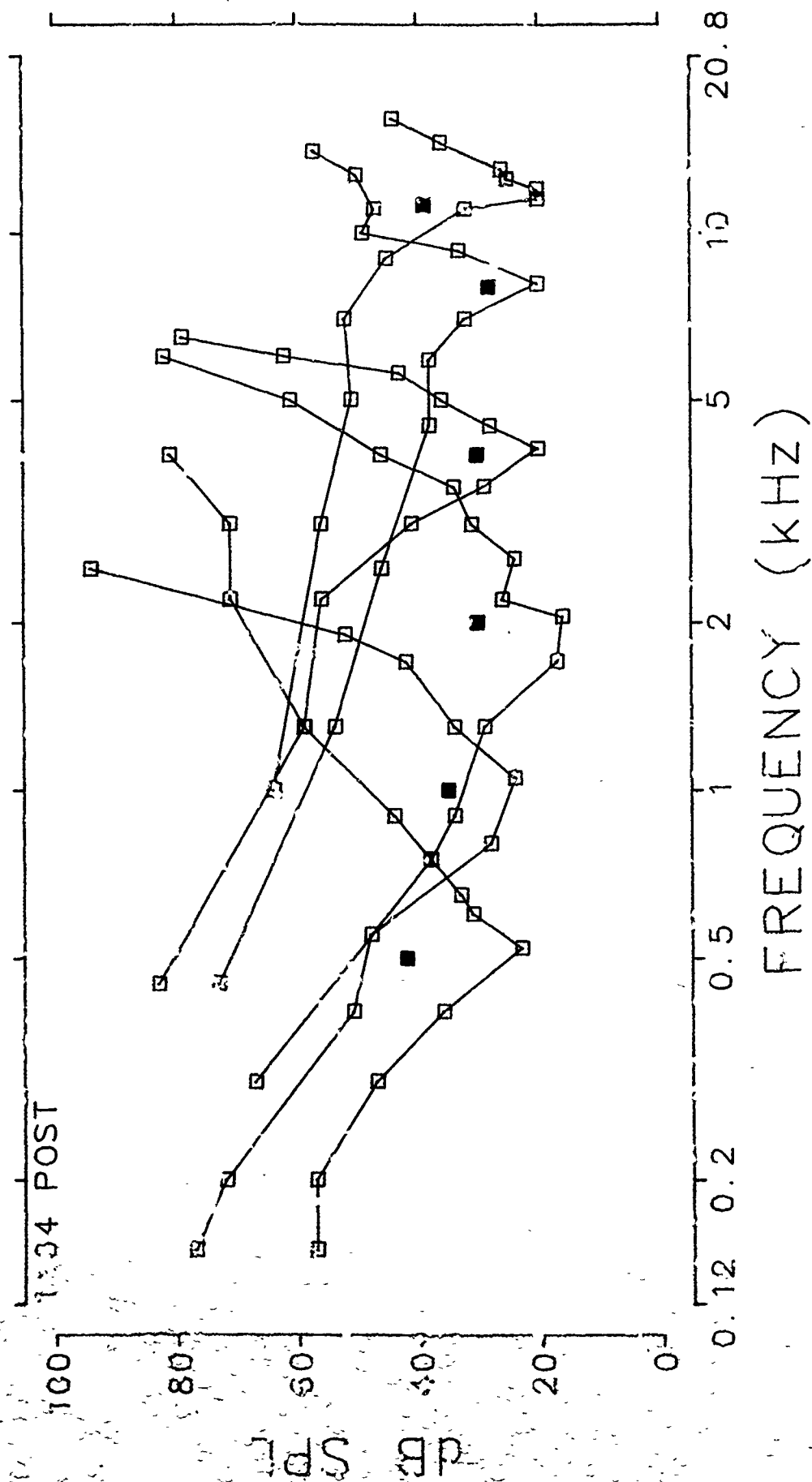
The solid symbol represents the threshold of the probe tone.

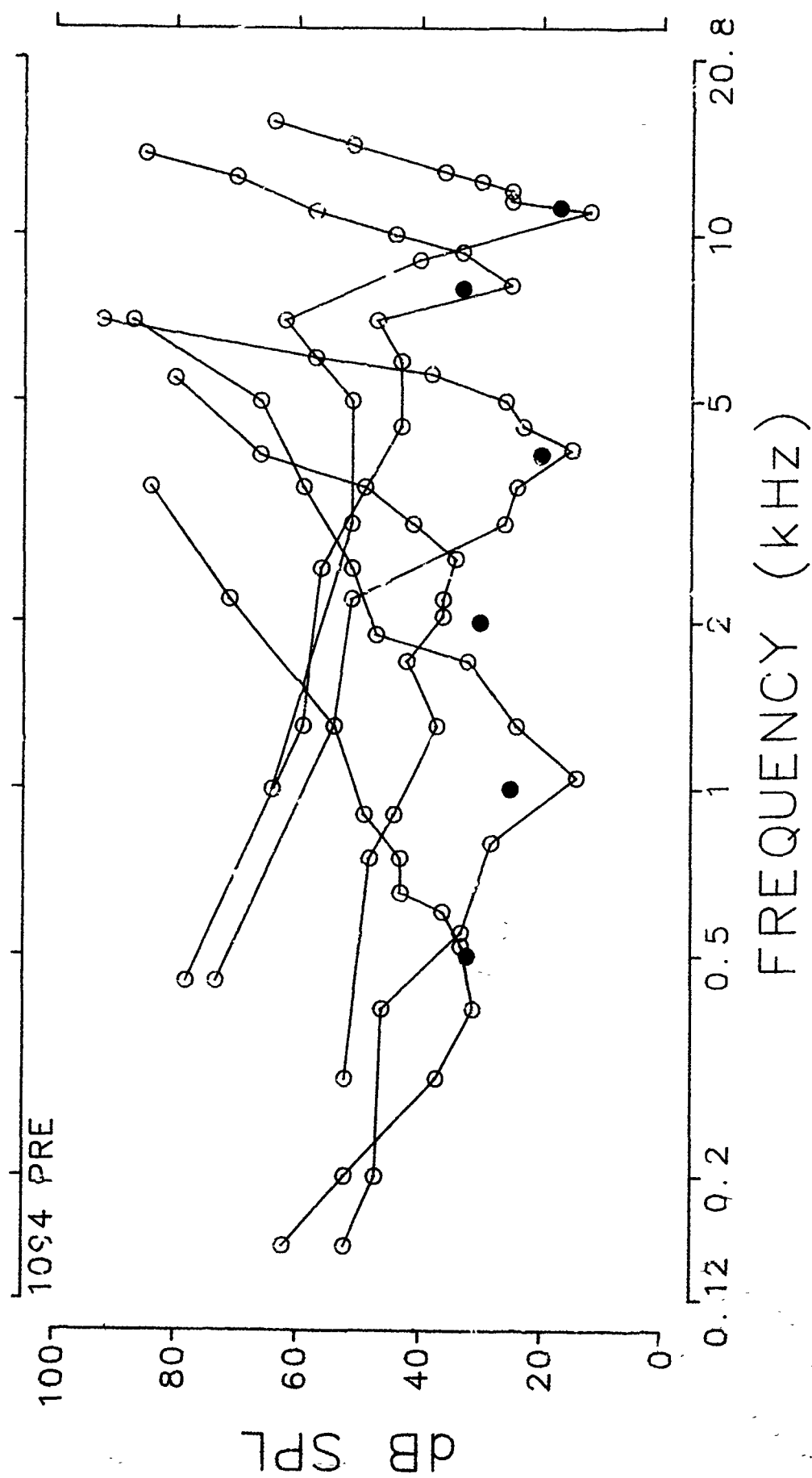


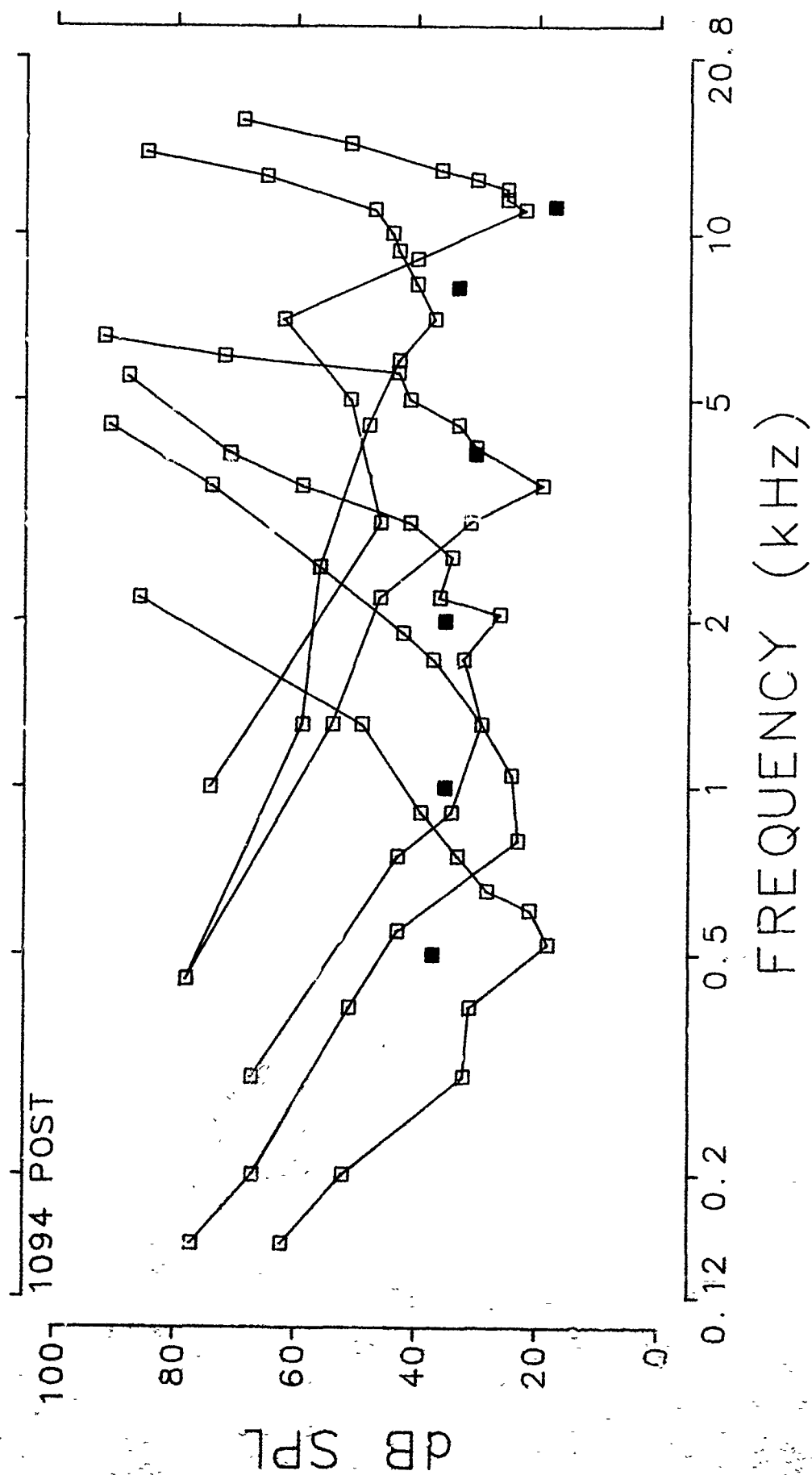


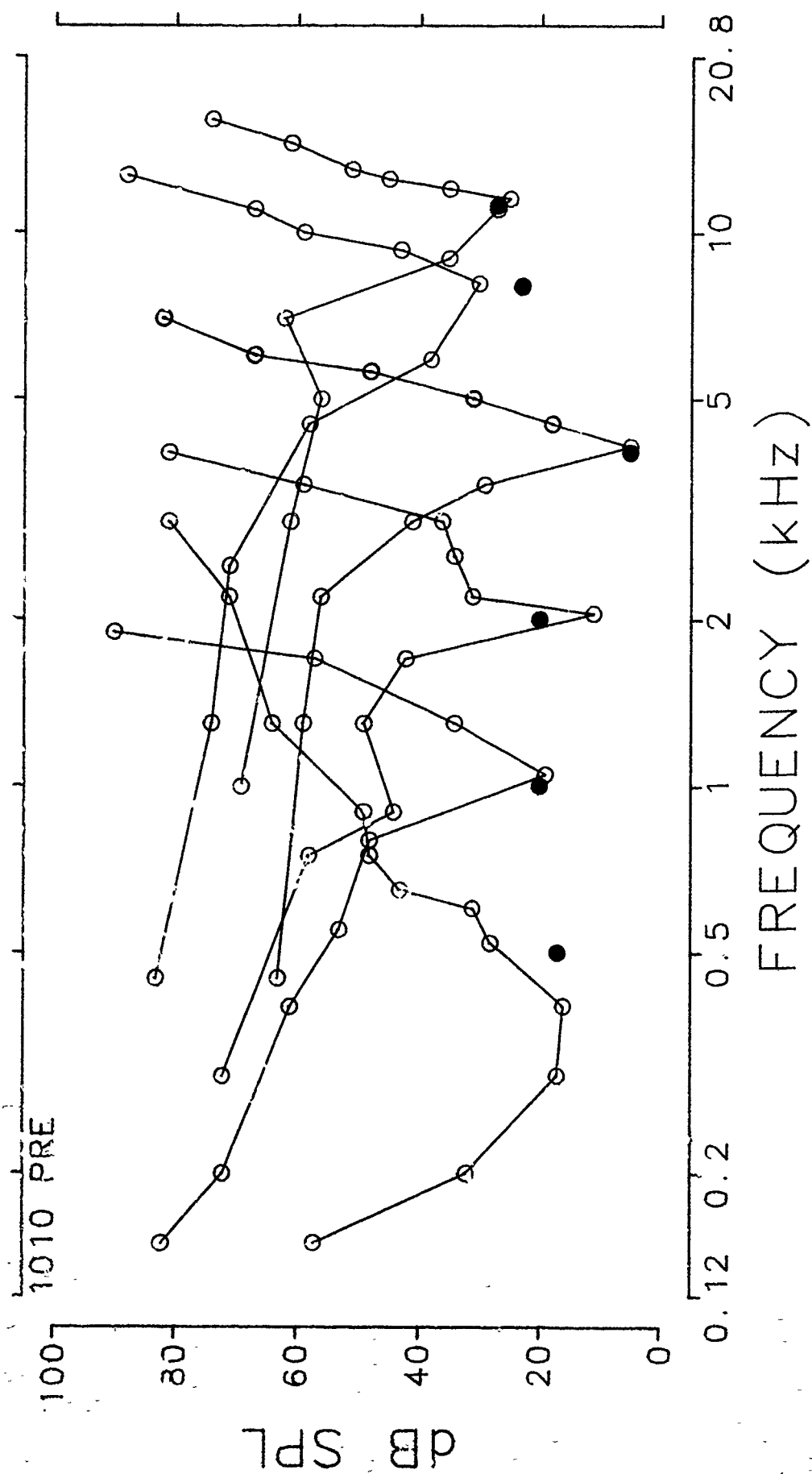


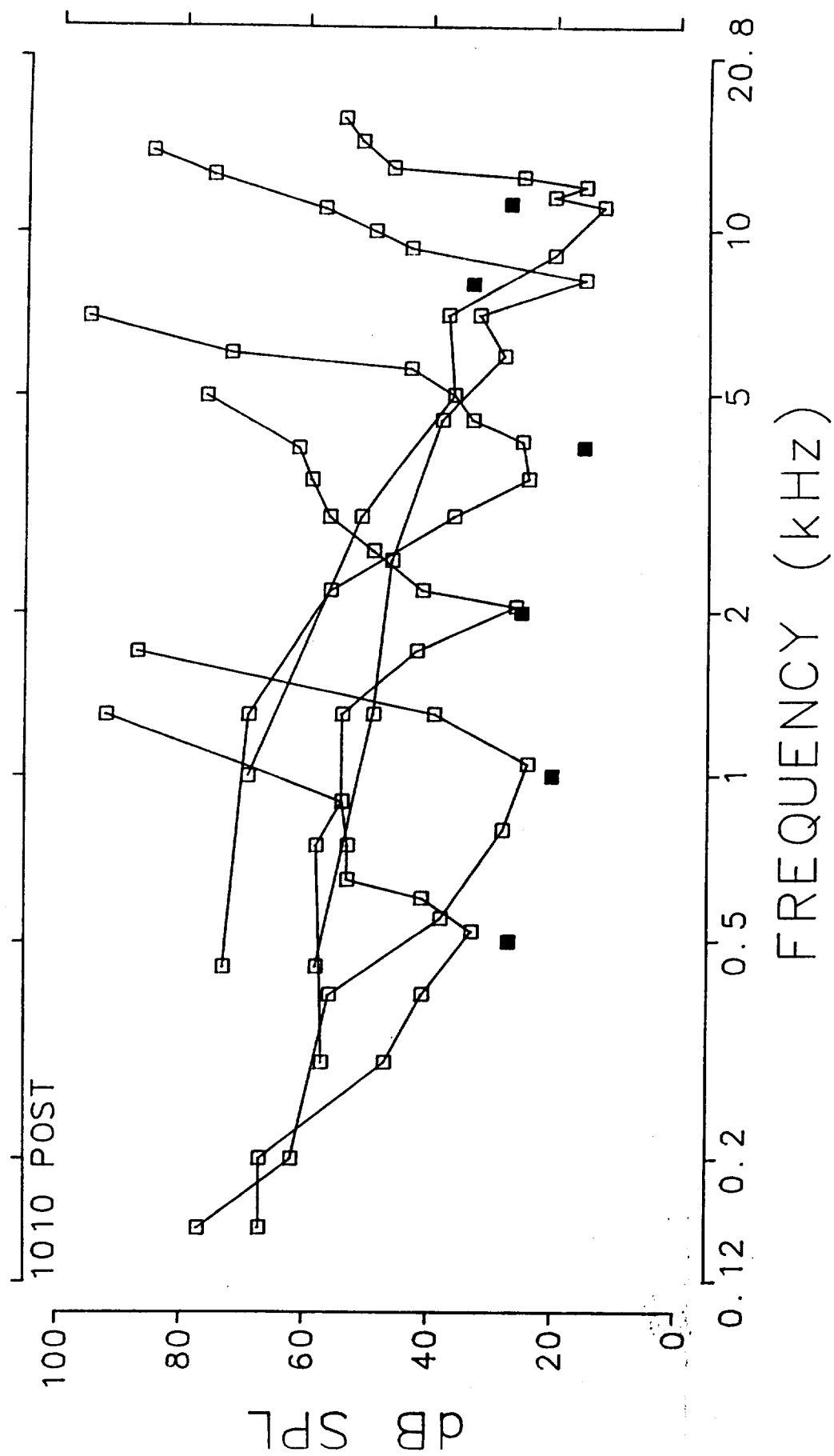












SHOCK TUBE EXPOSURE
150 dB, 10X, 1/MIN

TOTAL NUMBER OF COCHLEAR SENSORY CELLS MISSING

| ANIMAL NUMBER | INNER HAIR CELLS | 1ST ROW OUTER HAIR CELLS | 2ND ROW OUTER HAIR CELLS | 3RD ROW OUTER HAIR CELLS | TOTAL OUTER HAIR CELLS |
|------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------------------------|
| R1010R | 6 | 321 | 382 | 377 | 1080 |
| R1094R | 27 | 93 | 117 | 101 | 311 |
| R1104R | 16 | 36 | 56 | 120 | 212 |
| R1128R | 84 | 148 | 196 | 269 | 613 |
| R1231R | 46 | 259 | 334 | 146 | 739 |
| GROUP MEAN | 36 | | | | 591 |
| S.D. | 31 | | | | 348 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND LENGTHS OF THE
COCHLEA CENTERED AT THE FREQUENCIES INDICATED

| GROUP MEANS | OCTAVE BAND CENTER FREQUENCY | INNER HAIR CELLS | OUTER HAIR CELLS |
|---------------------|------------------------------------|------------------------|------------------------|
| | 0.125 kHz | 6.4 | 88.6 |
| | 0.25 kHz | 4.2 | 97.4 |
| | 0.5 kHz | 6.4 | 86.4 |
| | 1 kHz | 4.6 | 108.2 |
| | 2 kHz | 1.8 | 116.4 |
| | 4 kHz | 9.6 | 73.8 |
| | 8 kHz | 2.4 | 11.4 |
| | 16 kHz | .2 | 7.8 |
| STANDARD DEVIATIONS | | | |
| | 0.125 kHz | 6.5 | 59.8 |
| | 0.25 kHz | 6.1 | 76.9 |
| | 0.5 kHz | 10.5 | 100.8 |
| | 1 kHz | 7.5 | 107.7 |
| | 2 kHz | 1.9 | 145.7 |
| | 4 kHz | 17.6 | 123.3 |
| | 8 kHz | 1.5 | 12.6 |
| | 16 kHz | .4 | 5.9 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1010R | | | | | | | |
| 0.125 kHz | 2 | 20 | 89 | 76 | 185 | 0 | 0 |
| 0.25 kHz | 1 | 7 | 46 | 180 | 233 | 0 | 1 |
| 0.5 kHz | 0 | 4 | 4 | 43 | 51 | 0 | 0 |
| 1 kHz | 0 | 119 | 86 | 43 | 248 | 0 | 6 |
| 2 kHz | 0 | 169 | 156 | 30 | 355 | 0 | 2 |
| 4 kHz | 1 | 2 | 0 | 2 | 4 | 0 | 0 |
| 8 kHz | 2 | 0 | 1 | 3 | 4 | 0 | 0 |
| 16 kHz | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTALS | 6 | 321 | 382 | 377 | 1080 | 0 | 9 |

CHINCHILLA R1094R

| | | | | | | | |
|-----------|----|----|-----|-----|-----|---|---|
| 0.125 kHz | 8 | 15 | 5 | 10 | 30 | 0 | 0 |
| 0.25 kHz | 3 | 10 | 22 | 22 | 54 | 0 | 0 |
| 0.5 kHz | 3 | 9 | 26 | 9 | 44 | 0 | 0 |
| 1 kHz | 2 | 5 | 12 | 9 | 26 | 0 | 0 |
| 2 kHz | 5 | 19 | 14 | 12 | 45 | 2 | 2 |
| 4 kHz | 2 | 19 | 21 | 22 | 62 | 1 | 2 |
| 8 kHz | 2 | 10 | 9 | 11 | 30 | 0 | 0 |
| 16 kHz | 1 | 3 | 6 | 6 | 15 | 0 | 0 |
| TOTALS | 27 | 93 | 117 | 101 | 311 | 3 | 4 |

CHINCHILLA R1104R

| | | | | | | | |
|-----------|----|----|----|-----|-----|---|----|
| 0.125 kHz | 4 | 10 | 39 | 48 | 97 | 4 | 9 |
| 0.25 kHz | 2 | 6 | 9 | 55 | 70 | 0 | 0 |
| 0.5 kHz | 2 | 6 | 3 | 10 | 19 | 0 | 1 |
| 1 kHz | 1 | 8 | 1 | 5 | 14 | 1 | 1 |
| 2 kHz | 1 | 2 | 0 | 0 | 2 | 0 | 0 |
| 4 kHz | 4 | 2 | 2 | 0 | 4 | 0 | 0 |
| 8 kHz | 2 | 1 | 1 | 0 | 2 | 0 | 0 |
| 16 kHz | 0 | 1 | 1 | 2 | 4 | 0 | 0 |
| TOTALS | 16 | 36 | 56 | 120 | 212 | 5 | 11 |

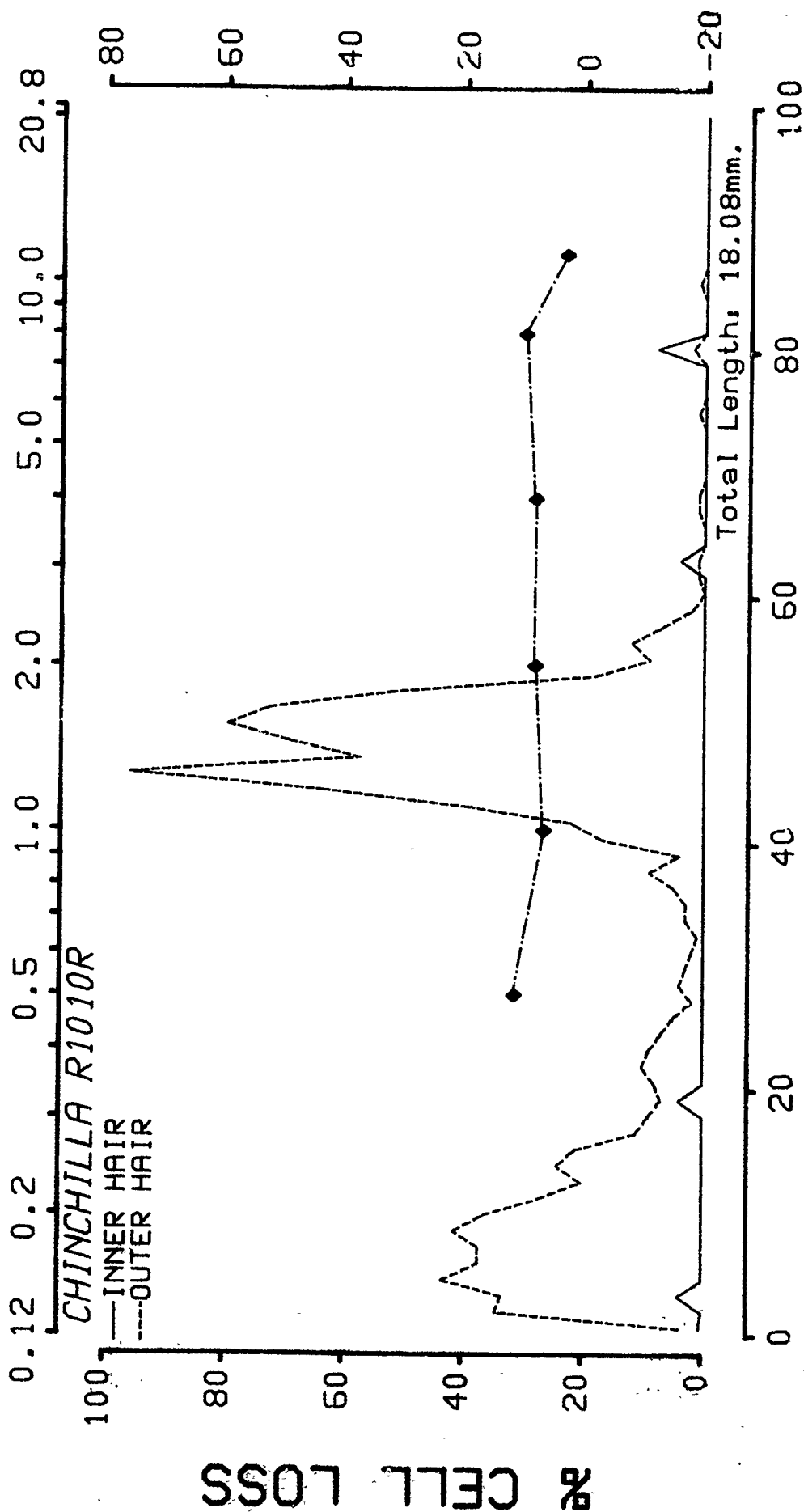
TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1128R | | | | | | | |
| 0.125 kHz | 17 | 6 | 25 | 49 | 80 | 0 | 6 |
| 0.25 kHz | 15 | 5 | 7 | 69 | 81 | 0 | 0 |
| 0.5 kHz | 2 | 9 | 23 | 21 | 53 | 0 | 0 |
| 1 kHz | 2 | 17 | 21 | 16 | 54 | 0 | 1 |
| 2 kHz | 2 | 4 | 12 | 9 | 25 | 0 | 1 |
| 4 kHz | 41 | 98 | 99 | 93 | 290 | 63 | 43 |
| 8 kHz | 5 | 4 | 5 | 10 | 19 | 0 | 0 |
| 16 kHz | 0 | 5 | 4 | 2 | 11 | 0 | 0 |
| TOTALS | 84 | 148 | 196 | 269 | 613 | 63 | 51 |

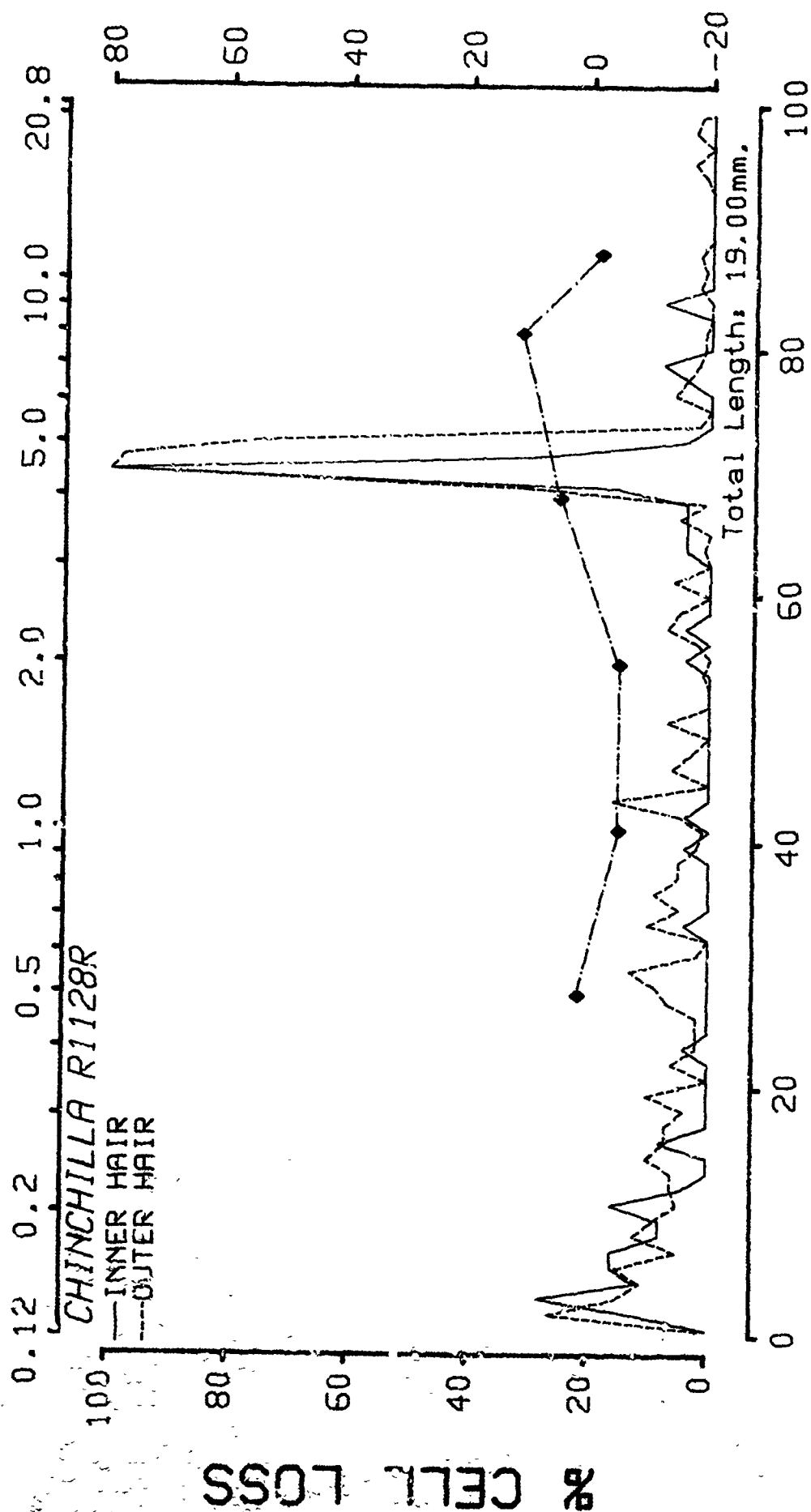
| | | | | | | | |
|-------------------|----|-----|-----|-----|-----|----|----|
| CHINCHILLA R1231R | | | | | | | |
| 0.125 kHz | 1 | 4 | 16 | 31 | 51 | 0 | 0 |
| 0.25 kHz | 0 | 2 | 13 | 34 | 49 | 0 | 1 |
| 0.5 kHz | 25 | 102 | 112 | 51 | 265 | 40 | 54 |
| 1 kHz | 18 | 79 | 104 | 16 | 199 | 5 | 8 |
| 2 kHz | 1 | 62 | 86 | 7 | 155 | 1 | 1 |
| 4 kHz | 0 | 7 | 0 | 2 | 9 | 1 | 0 |
| 8 kHz | 1 | 1 | 1 | 0 | 2 | 0 | 0 |
| 16 kHz | 0 | 2 | 2 | 5 | 9 | 0 | 0 |
| TOTALS | 46 | 259 | 334 | 146 | 739 | 47 | 64 |

Cochleograms and PTS Audiograms
for Individual Animals

FREQUENCY (kHz)

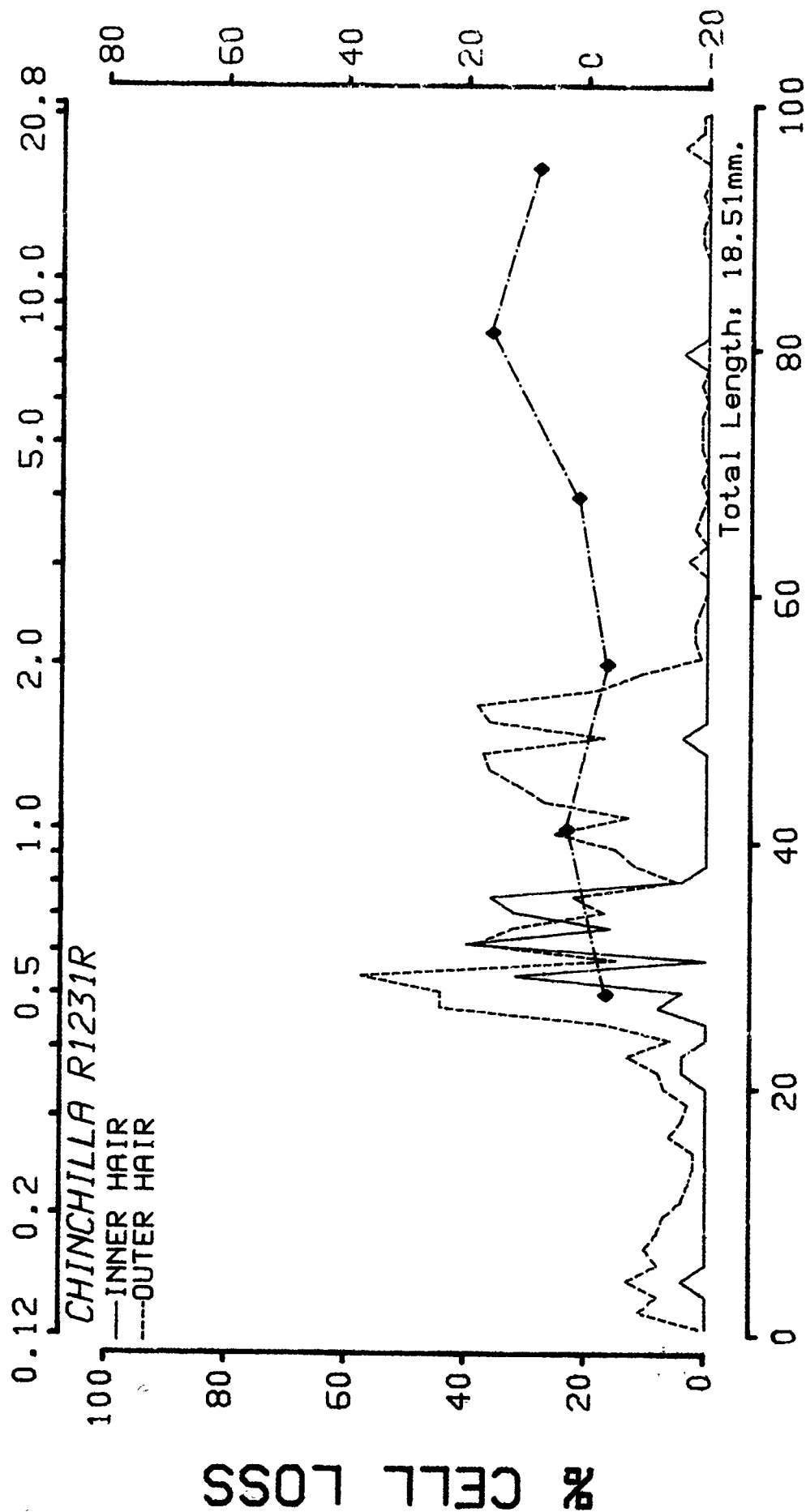


FREQUENCY (kHz)



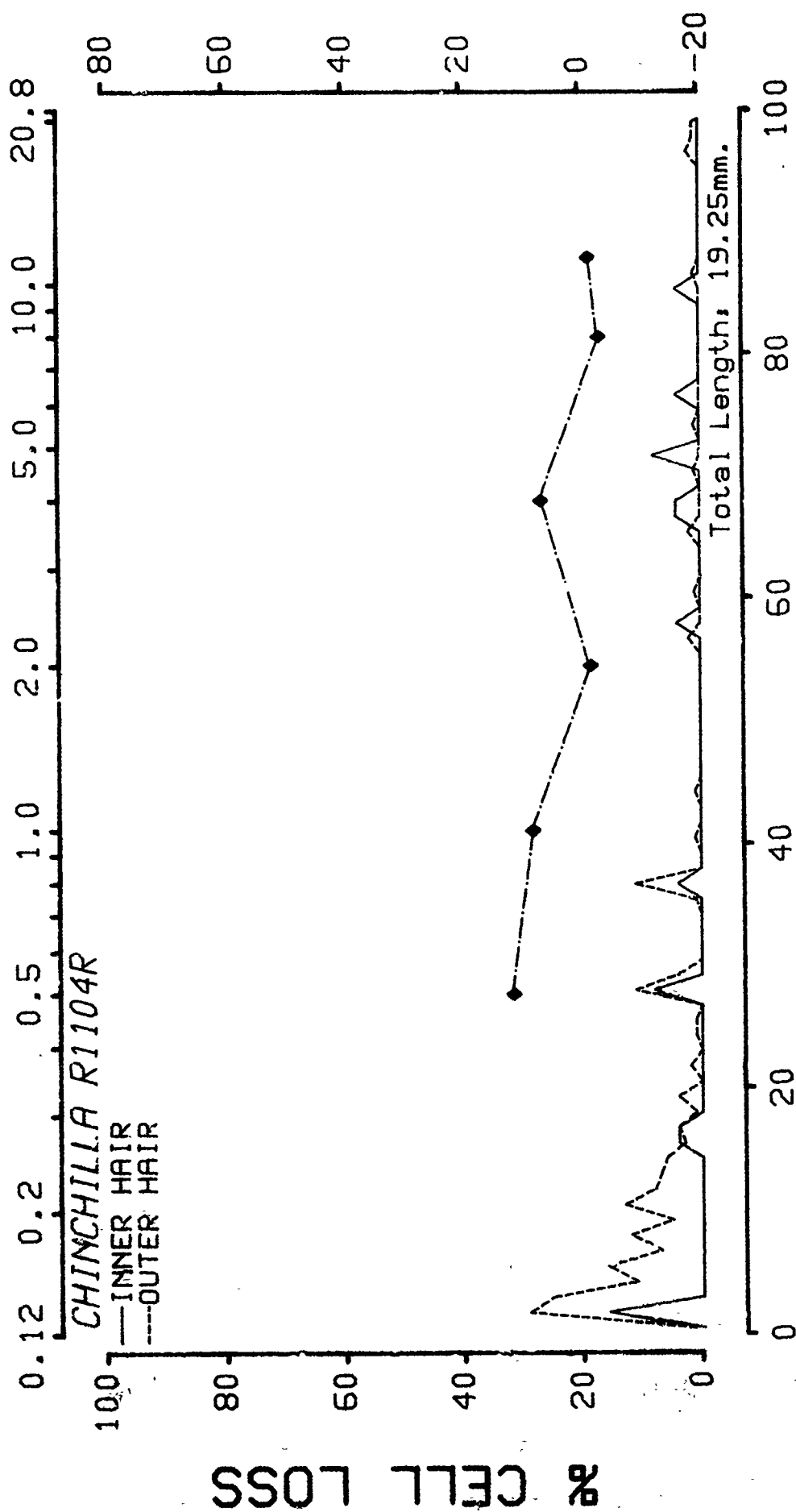
% TOTAL DISTANCE FROM APEX

FREQUENCY (KHZ)



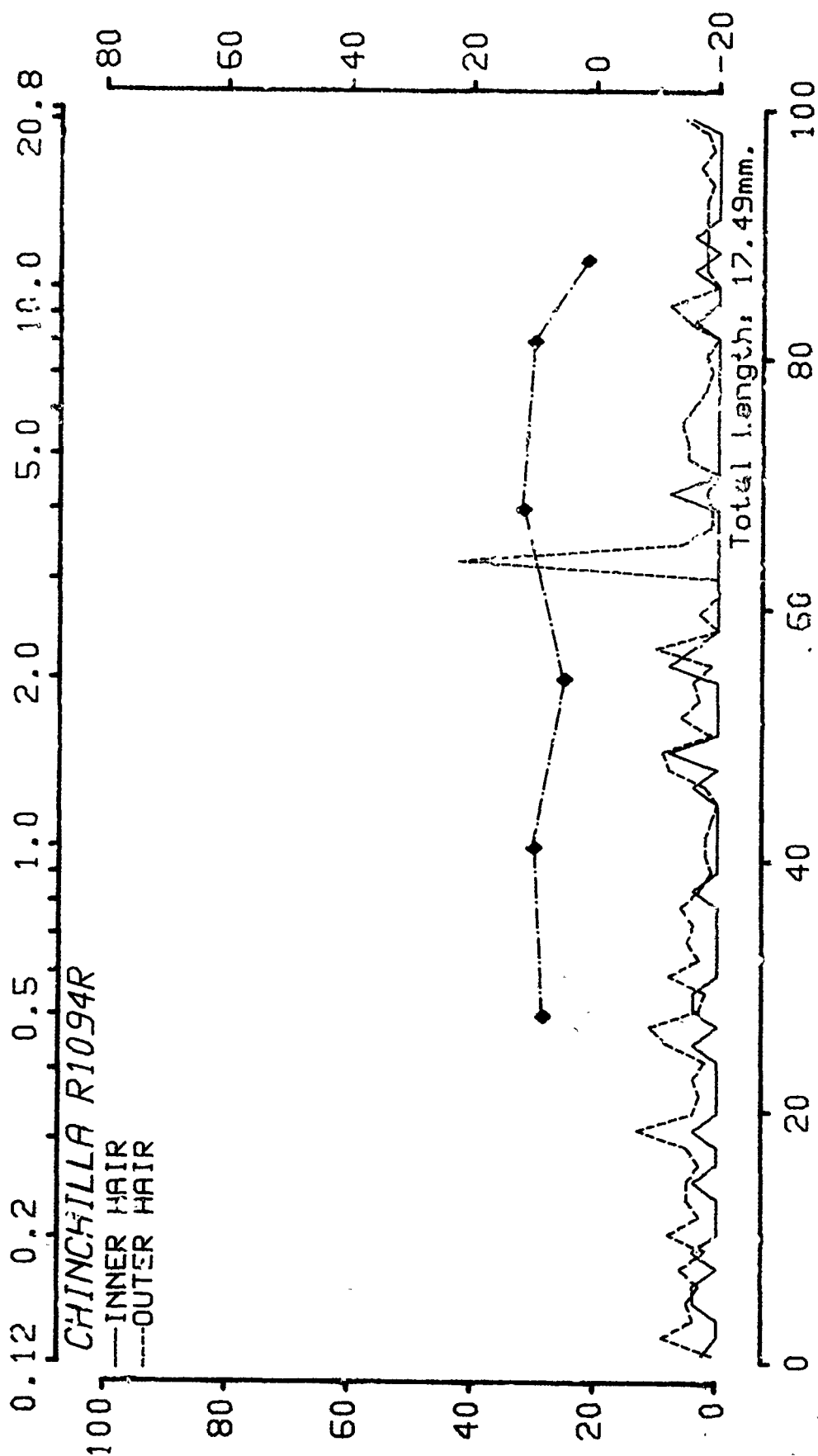
% TOTAL DISTANCE FROM APEX

FREQUENCY (KHZ)



% TOTAL DISTANCE FROM APEX

FREQUENCY (kHz)



% CELL LOSS

% TOTAL DISTANCE FROM APEX

Summary Data for the Group Exposed to:

150 dB, 100X, 1/M

Animal

| | | |
|------|---|--|
| 1365 | - | Completed the Entire Protocol |
| 1448 | - | Completed the Entire Protocol |
| 1510 | - | Completed the Entire Protocol |
| 1564 | - | Completed the Entire Protocol |
| 1597 | - | Completed the Entire Protocol |
| 1539 | - | No Tuning Curves Collected |
| 1452 | - | Audiometric data not used. The left cochlea was not destroyed. |

150 dB 100X 1/M

PRE-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1365 | 17.5 | 10.8 | 10.8 | 2.5 | 15.8 | 20.8 | ***** |
| 1448 | 25.8 | 12.5 | 9.2 | 4.2 | 10.8 | 7.5 | ***** |
| 1510 | 29.2 | 14.2 | 20.8 | 12.5 | 27.5 | 27.5 | ***** |
| 1539 | 20.8 | 15.8 | 22.5 | 20.8 | 32.5 | 29.2 | ***** |
| 1564 | 35.8 | 22.5 | 15.8 | 10.8 | 20.8 | 20.8 | ***** |
| 1597 | 25.0 | 17.5 | 10.8 | 5.8 | 27.5 | 29.2 | ***** |
| Mean | 25.7 | 15.6 | 15.0 | 9.4 | 22.5 | 22.5 | ***** |
| S.D. | 6.4 | 4.1 | 5.7 | 6.8 | 8.2 | 8.3 | ***** |

POST-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1365 | 39.2 | 34.2 | 30.8 | 19.2 | 25.8 | 22.5 | ***** |
| 1448 | 24.2 | 15.8 | 15.8 | -0.8 | 5.8 | 12.5 | ***** |
| 1510 | 27.5 | 15.8 | 24.2 | 19.2 | 29.2 | 29.2 | ***** |
| 1539 | 49.2 | 37.5 | 30.8 | 32.5 | 40.8 | 40.8 | ***** |
| 1564 | 39.2 | 40.8 | 39.2 | 12.5 | 25.8 | 25.8 | ***** |
| 1597 | 55.8 | 39.2 | 37.5 | 9.2 | 19.2 | 39.2 | ***** |
| Mean | 39.2 | 30.6 | 29.7 | 15.3 | 24.4 | 28.3 | ***** |
| S.D. | 12.2 | 11.6 | 8.7 | 11.2 | 11.6 | 10.6 | ***** |

PERMANENT THRESHOLD SHIFT (dB)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1365 | 21.7 | 23.3 | 20.0 | 16.7 | 10.0 | 1.7 | ***** |
| 1448 | -1.7 | 3.3 | 6.7 | -5.0 | -5.0 | 5.0 | ***** |
| 1510 | -1.7 | 1.7 | 3.3 | 6.7 | 1.7 | 1.7 | ***** |
| 1539 | 28.3 | 21.7 | 8.3 | 11.7 | 6.3 | 11.7 | ***** |
| 1564 | 3.3 | 18.3 | 23.3 | 1.7 | 5.0 | 5.0 | ***** |
| 1597 | 30.8 | 21.7 | 26.7 | 3.3 | -8.3 | 10.0 | ***** |
| Mean | 13.5 | 15.0 | 14.7 | 5.8 | 2.0 | 5.8 | ***** |
| S.D. | 15.2 | 9.8 | 9.8 | 7.7 | 7.3 | 4.2 | ***** |

150 dB 100X 1/M

TEMPORARY THRESHOLD SHIFT (dB)

Frequency 0.5 kHz

| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
|-----------|-------|-------|-------|------|-------|------|
| 1365 | 65.0 | 72.5* | 45.0 | 30.0 | 15.0 | 72.5 |
| 1448 | 46.7 | 36.7 | 16.7 | 6.7 | ***** | 46.7 |
| 1510 | 43.3 | 23.3 | 3.3 | 18.3 | 3.3 | 43.3 |
| 1539 | 41.7 | 41.7 | 26.7 | 26.7 | 21.7 | 41.7 |
| 1564 | 54.2* | 54.2* | 54.2* | 26.7 | 1.7 | 54.2 |
| 1597 | 60.0* | 60.0* | 60.0* | 42.5 | 17.5 | 60.0 |
| Mean | 51.8 | 48.1 | 34.3 | 25.1 | 11.8 | 53.1 |
| S.D. | 9.5 | 17.7 | 22.4 | 12.0 | 8.9 | 11.8 |

Frequency 2.0 kHz

| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
|-----------|-------|-------|------|------|-------|------|
| 1365 | 66.7 | 66.7 | 46.7 | 36.7 | 21.7 | 66.7 |
| 1448 | 58.3 | 53.3 | 33.3 | 13.3 | ***** | 58.3 |
| 1510 | 51.7 | 41.7 | 21.7 | -3.3 | 6.7 | 51.7 |
| 1539 | 40.0 | 30.0 | 15.0 | 15.0 | 5.0 | 40.0 |
| 1564 | 74.2* | 74.2* | 66.7 | 41.7 | 26.7 | 74.2 |
| 1597 | 74.2* | 74.2* | 66.7 | 51.7 | 26.7 | 74.2 |
| Mean | 60.8 | 56.7 | 41.7 | 25.8 | 17.3 | 60.8 |
| S.D. | 13.5 | 18.2 | 22.2 | 20.8 | 10.7 | 13.5 |

Frequency 8.0 kHz

| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
|-----------|-------|-------|-------|------|-------|------|
| 1365 | 74.2* | 74.2* | 16.7 | -3.3 | 1.7 | 74.2 |
| 1448 | 51.7 | 56.7 | 11.7 | -8.3 | ***** | 56.7 |
| 1510 | 62.5* | 52.5* | 20.0 | 25.0 | 10.0 | 62.5 |
| 1539 | 30.0 | 20.0 | 15.0 | 5.0 | 5.0 | 30.0 |
| 1564 | 61.7 | 69.2* | 56.7 | 16.7 | 11.7 | 69.2 |
| 1597 | 57.5* | 57.5* | 57.5* | 35.0 | 15.0 | 57.5 |
| Mean | 56.2 | 55.0 | 29.6 | 11.7 | 8.7 | 58.3 |
| S.D. | 14.8 | 19.0 | 21.5 | 16.8 | 5.3 | 15.4 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 100X 1/M

Probe Frequency: 0.5 kHz

| Masker (kHz): | 0.150 | 0.200 | 0.300 | 0.400 | 0.520 | 0.600 | 0.650 | 0.750 | 1.300 | 2.200 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1365 (3.57) | 67.5 | 52.5 | 32.5 | 27.5 | 17.5 | 12.5 | 32.5 | 32.5 | 47.5 | 90.0* |
| 1448 (3.11) | 67.5 | 62.5 | 52.5 | 47.5 | 37.5 | 32.5 | 42.5 | 42.5 | 72.5 | 92.5 |
| 1510 (1.91) | 72.5 | 72.5 | 57.5 | 52.5 | 47.5 | 42.5 | 37.5 | 37.5 | 77.5 | 95.0* |
| 1564 (1.28) | 67.5 | 67.5 | 62.5 | 62.5 | 57.5 | 52.5 | 57.5 | 52.5 | 90.0* | 97.5 |
| 1597 (2.27) | 87.5 | 87.5 | 57.5 | 62.5 | 52.5 | 47.5 | 42.5 | 40.0 | 72.5 | 87.5 |
| Mean (2.43) | 72.5 | 68.5 | 52.5 | 50.5 | 42.5 | 37.5 | 42.5 | 41.0 | 72.0 | 92.5 |
| S.D. (9.92) | 8.7 | 12.9 | 11.7 | 14.4 | 15.8 | 15.8 | 9.4 | 7.4 | 15.5 | 4.0 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1365 (4.55) | 67.5 | 57.5 | 57.5 | 52.5 | 37.5 | 27.5 | 37.5 | 57.5 | 87.5 | 82.5 |
| 1448 (1.30) | 67.5 | 57.5 | 47.5 | 42.5 | 32.5 | 32.5 | 37.5 | 37.5 | 80.0* | 90.0* |
| 1510 (1.49) | 57.5 | 57.5 | 47.5 | 42.5 | 32.5 | 27.5 | 27.5 | 27.5 | 67.5 | 90.0* |
| 1564 (1.72) | 72.5 | 67.5 | 67.5 | 67.5 | 62.5 | 57.5 | 57.5 | 67.5 | 95.0* | 100.0* |
| 1597 (2.18) | 77.5 | 77.5 | 72.5 | 67.5 | 62.5 | 62.5 | 57.5 | 77.5 | 87.5 | 92.5 |
| Mean (2.27) | 68.5 | 63.5 | 58.5 | 54.5 | 45.5 | 41.5 | 43.5 | 53.5 | 83.5 | 91.0 |
| S.D. (1.37) | 7.4 | 8.9 | 11.4 | 12.5 | 15.7 | 17.1 | 13.4 | 20.7 | 10.4 | 6.3 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 100X 1/M

Probe Frequency: 1.0 kHz

| Masker (kHz): | 0.150 | 0.200 | 0.400 | 0.550 | 0.800 | 1.050 | 1.300 | 1.700 | 1.900 | 2.500 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1365 (2.10) | 95.0* | 90.0* | 62.5 | 47.5 | 37.5 | 27.5 | 37.5 | 62.5 | 72.5 | 90.0* |
| 1448 (1.05) | 72.5 | 62.5 | 47.5 | 32.5 | 27.5 | 22.5 | 22.5 | 37.5 | 42.5 | 72.5 |
| 1510 (2.55) | 72.5 | 72.5 | 52.5 | 42.5 | 32.5 | 22.5 | 37.5 | 52.5 | 50.0 | 67.5 |
| 1564 (1.45) | 72.5 | 72.5 | 67.5 | 57.5 | 52.5 | 50.0* | 47.5 | 72.5 | 80.0* | 90.0* |
| 1597 (1.58) | 87.5 | 87.5 | 72.5 | 57.5 | 42.5 | 37.5 | 42.5 | 67.5 | 77.5 | 87.5 |
| Mean (1.74) | 80.0 | 77.0 | 60.5 | 47.5 | 38.5 | 32.0 | 37.5 | 58.5 | 64.5 | 81.5 |
| S.D. (0.59) | 10.6 | 11.5 | 10.4 | 10.6 | 9.6 | 11.8 | 9.4 | 13.9 | 17.1 | 10.7 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1365 (1.70) | 77.5 | 82.5 | 77.5 | 67.5 | 62.5 | 57.5 | 77.5 | 97.5 | 97.5 | 102.5 |
| 1448 (1.59) | 72.5 | 67.5 | 52.5 | 42.5 | 37.5 | 32.5 | 47.5 | 70.0* | 77.5 | 90.0* |
| 1510 (1.65) | 72.5 | 67.5 | 52.5 | 42.5 | 32.5 | 27.5 | 37.5 | 57.5 | 62.5 | 77.5 |
| 1564 (2.38) | 87.5 | 87.5 | 87.5 | 82.5 | 67.5 | 82.5 | 90.0* | 92.5 | 100.0* | 100.0* |
| 1597 (1.28) | 67.5 | 67.5 | 62.5 | 57.5 | 47.5 | 42.5 | 47.5 | 57.5 | 57.5 | 50.0 |
| Mean (1.72) | 75.5 | 74.5 | 66.5 | 58.5 | 49.5 | 48.5 | 60.0 | 75.0 | 79.0 | 84.0 |
| S.D. (0.41) | 7.6 | 9.7 | 15.6 | 17.1 | 15.2 | 22.2 | 22.5 | 19.0 | 19.5 | 21.4 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 100X 1/M

Probe Frequency: 2.0 kHz

Masker (kHz): 0.300 0.750 0.900 1.300 1.700 2.050 2.200 3.000 3.500 4.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|-------|-------|
| 1365 (1.26) | 67.5 | 47.5 | 42.5 | 40.0 | 45.0 | **** | 42.5 | 57.5 | 82.5 | 82.5 |
| 1448 (5.34) | 67.5 | 35.0 | 30.0 | 32.5 | 25.0 | 12.5 | 27.5 | 37.5 | 57.5 | 90.0* |
| 1510 (6.88) | 77.5 | 57.5 | 62.5 | 57.5 | 47.5 | 22.5 | 32.5 | 47.5 | 80.0* | 85.0* |
| 1564 (2.70) | 62.5 | 52.5 | 37.5 | 42.5 | 42.5 | 27.5 | 32.5 | 42.5 | 47.5 | 90.0* |
| 1597 (4.01) | 87.5 | 42.5 | 37.5 | 37.5 | 37.5 | 17.5 | 22.5 | 42.5 | 57.5 | 72.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (4.04) | 72.5 | 47.0 | 42.0 | 42.0 | 39.5 | 20.0 | 31.5 | 45.5 | 65.0 | 84.0 |
| S.D. (2.20) | 10.0 | 8.7 | 12.3 | 9.4 | 8.9 | 6.5 | 7.4 | 7.6 | 15.4 | 7.2 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|-------|-------|-------|
| 1365 (9.28) | 72.5 | 47.5 | 47.5 | 57.5 | 62.5 | 37.5 | 57.5 | 80.0* | 80.0* | 90.0* |
| 1448 (3.58) | 50.0 | 30.0 | 30.0 | 35.0 | 27.5 | 7.5 | 7.5 | 37.5 | 57.5 | 90.0* |
| 1510 (6.88) | 67.5 | 42.5 | 42.5 | 42.5 | 47.5 | 22.5 | 32.5 | 37.5 | 57.5 | 72.5 |
| 1564 (****) | 87.5 | 67.5 | 62.5 | 62.5 | 67.5 | 57.5 | 62.5 | 52.5 | 42.5 | 47.5 |
| 1597 (0.94) | 67.5 | 47.5 | 42.5 | 37.5 | 37.5 | 37.5 | 32.5 | 37.5 | 47.5 | 87.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (5.17) | 69.0 | 47.0 | 45.0 | 47.0 | 48.5 | 32.5 | 38.5 | 49.0 | 57.0 | 77.5 |
| S.D. (3.66) | 13.4 | 13.5 | 11.7 | 12.3 | 16.7 | 18.7 | 22.2 | 18.5 | 14.4 | 18.3 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 100X 1/M

Probe Frequency: 4.0 kHz

| Masker (kHz): | 0.450 | 1.300 | 2.200 | 3.000 | 3.500 | 4.100 | 4.500 | 5.000 | 5.600 | 6.000 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1365 (3.74) | 72.5 | 57.5 | 52.5 | 47.5 | 32.5 | 22.5 | 27.5 | 52.5 | 67.5 | 77.5 |
| 1448 (2.81) | 72.5 | 57.5 | 51.5 | 47.5 | 27.5 | 22.5 | 22.5 | 37.5 | 62.5 | 95.0* |
| 1510 (4.61) | 75.0* | 57.5 | 42.5 | 42.5 | 32.5 | 17.5 | 22.5 | 52.5 | 52.5 | 62.5 |
| 1564 (3.26) | 77.5 | 57.5 | 47.5 | 42.5 | 32.5 | 27.5 | 37.5 | 42.5 | 47.5 | 52.5 |
| 1597 (3.71) | 77.5 | 57.5 | 52.5 | 42.5 | 17.5 | 12.5 | 22.5 | 37.5 | 47.5 | 62.5 |
| Mean (3.62) | 75.0 | 57.5 | 49.3 | 44.5 | 28.5 | 20.5 | 26.5 | 44.5 | 55.5 | 70.0 |
| S.D. (0.67) | 2.5 | 0.0 | 4.3 | 2.7 | 6.5 | 5.7 | 6.5 | 7.6 | 9.1 | 16.6 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1365 (2.47) | 73.5 | 62.5 | 67.5 | 57.5 | 42.5 | 47.5 | 47.5 | 80.0* | 97.5 | 95.0* |
| 1448 (4.10) | 72.5 | 62.5 | 42.5 | 42.5 | 27.5 | 17.5 | 27.5 | 47.5 | 62.5 | 72.5 |
| 1510 (4.10) | 80.0* | 67.5 | 70.0* | 52.5 | 42.5 | 32.5 | 42.5 | 67.5 | 62.5 | 72.5 |
| 1564 (3.26) | 77.5 | 57.5 | 57.5 | 47.5 | 37.5 | 32.5 | 42.5 | 52.5 | 62.5 | 87.5 |
| 1597 (****) | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| Mean (3.48) | 75.6 | 62.5 | 59.4 | 50.0 | 37.5 | 32.5 | 40.0 | 61.9 | 71.3 | 81.9 |
| S.D. (0.78) | 3.7 | 4.1 | 12.5 | 6.5 | 7.1 | 12.2 | 8.7 | 14.8 | 17.5 | 11.3 |

MARKED THRESHOLDS (dB SPL) Group: 150 dB 100X 1/M

Probe Frequency: 8.0 kHz

| Masker (kHz): | 0.450 | 1.300 | 2.500 | 5.900 | 7.000 | 8.100 | 9.300 | 11.000 | 12.700 | 14.000 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1365 (4.58) | 72.5 | 62.5 | 72.5 | 47.5 | 47.5 | 27.5 | 37.5 | 90.0* | 95.0* | 85.0* |
| 1448 (7.68) | 87.5 | 67.5 | 67.5 | 52.5 | 60.0 | 17.5 | 32.5 | 67.5 | 75.0* | 87.5 |
| 1510 (1.77) | 75.0* | 70.0* | 62.5 | 37.5 | 27.5 | 22.5 | 27.5 | 32.5 | 57.5 | 57.5 |
| 1564 (3.57) | 82.5 | 57.5 | 62.5 | 52.5 | 37.5 | 32.5 | 47.5 | 62.5 | 90.0* | 95.0* |
| 1597 (2.29) | 72.5 | 62.5 | 57.5 | 47.5 | 32.5 | 32.5 | 42.5 | 67.5 | 72.5 | 77.5 |
| Mean (3.98) | 78.0 | 64.0 | 64.5 | 47.5 | 41.0 | 26.5 | 37.5 | 64.0 | 78.0 | 80.5 |
| S.D. (2.34) | 6.7 | 4.9 | 5.7 | 6.1 | 12.9 | 6.5 | 7.9 | 20.6 | 14.9 | 14.3 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1365 (3.10) | 92.5 | 72.5 | 72.5 | 42.5 | 37.5 | 32.5 | 60.0* | 95.0* | 95.0* | 85.0* |
| 1448 (4.25) | 80.0* | 70.0* | 57.5 | 42.5 | 27.5 | 22.5 | 50.0* | 52.5 | 67.5 | 72.5 |
| 1510 (3.26) | 82.5 | 72.5 | 62.5 | 52.5 | 47.5 | 32.5 | 37.5 | 52.5 | 75.0* | 85.0* |
| 1564 (4.31) | 87.5 | 62.5 | 62.5 | 42.5 | 47.5 | 37.5 | 52.5 | 62.5 | 77.5 | 92.5 |
| 1597 (*****) | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** |
| Mean (3.73) | 85.6 | 69.4 | 63.8 | 45.0 | 40.0 | 31.2 | 50.0 | 65.6 | 78.8 | 83.8 |
| S.D. (0.64) | 5.5 | 4.7 | 6.3 | 5.0 | 9.6 | 6.3 | 9.4 | 20.1 | 11.6 | 8.3 |

MASKED THRESHOLDS (dB SPL) Group: 150 dB 100X 1/M

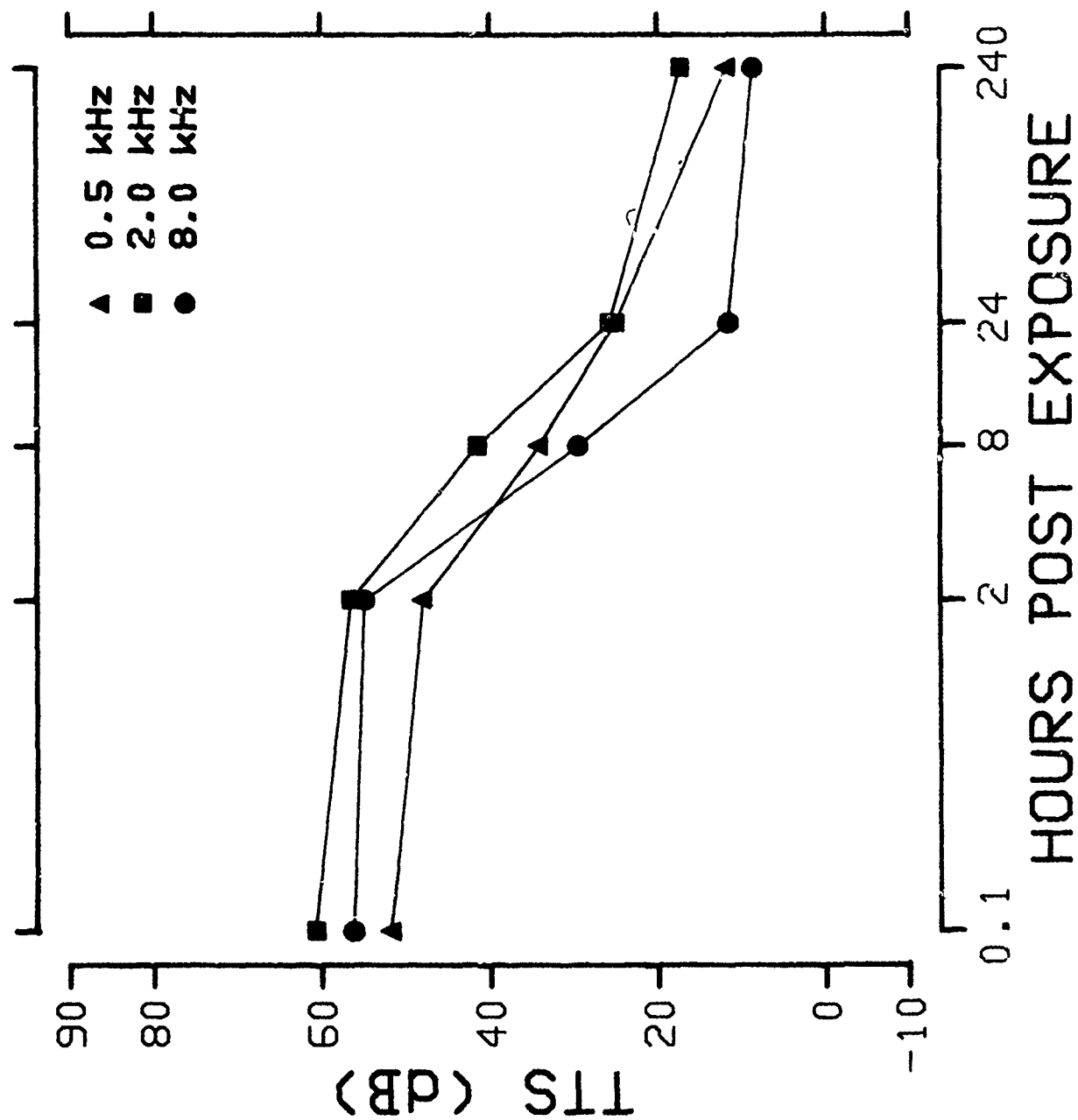
Probe Frequency: 11.2 kHz

| Masker (kHz): | 1.000 | 4.000 | 7.000 | 9.000 | 11.000 | 11.500 | 12.000 | 13.000 | 14.500 | 16.000 |
|------------------|--------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1365 (8.81) | 72.5 | 47.5 | 62.5 | 52.5 | 32.5 | 57.5 | 37.5 | 47.5 | 62.5 | 90.0* |
| 1448 (7.24) | 62.5 | 52.5 | 57.5 | 57.5 | 32.5 | 27.5 | 22.5 | 37.5 | 47.5 | 90.0* |
| 1510 (2.99) | 65.0* | 52.5 | 65.0* | 45.0* | 27.5 | 27.5 | 32.5 | 32.5 | 47.5 | 52.5 |
| 1564 (5.36) | 72.5 | 52.5 | 62.5 | 42.5 | 22.5 | 27.5 | 32.5 | 32.5 | 32.5 | 47.5 |
| 1597 (4.63) | 67.5 | 52.5 | 52.5 | 57.5 | 27.5 | 17.5 | 22.5 | 22.5 | 37.5 | 57.5 |
| Mean (5.81) | 68.0 | 51.5 | 60.0 | 51.0 | 28.5 | 31.5 | 29.5 | 34.5 | 45.5 | 67.5 |
| S.D. (2.27) | 4.5 | 2.2 | 5.0 | 7.0 | 4.2 | 15.2 | 6.7 | 9.1 | 11.5 | 20.8 |

| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
|------------------|---------------|------|------|------|------|------|------|------|------|-------|
| 1365 (3.43) | 67.5 | 47.5 | 62.5 | 62.5 | 37.5 | 42.5 | 37.5 | 42.5 | 62.5 | 90.0* |
| 1448 (****) | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 1510 (7.47) | 67.5 | 52.5 | 57.5 | 47.5 | 27.5 | 22.5 | 32.5 | 47.5 | 47.5 | 72.5 |
| 1564 (2.85) | 67.5 | 52.5 | 57.5 | 52.5 | 37.5 | 37.5 | 42.5 | 42.5 | 57.5 | 77.5 |
| 1597 (****) | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| Mean (4.58) | 67.5 | 50.8 | 59.2 | 54.2 | 34.2 | 34.2 | 37.5 | 44.2 | 55.8 | 80.0 |
| S.D. (2.52) | 0.0 | 2.9 | 2.9 | 7.6 | 5.8 | 10.4 | 5.0 | 2.9 | 7.6 | 9.0 |

The Group Mean Recovery Curves
Measured at Three Test Frequencies

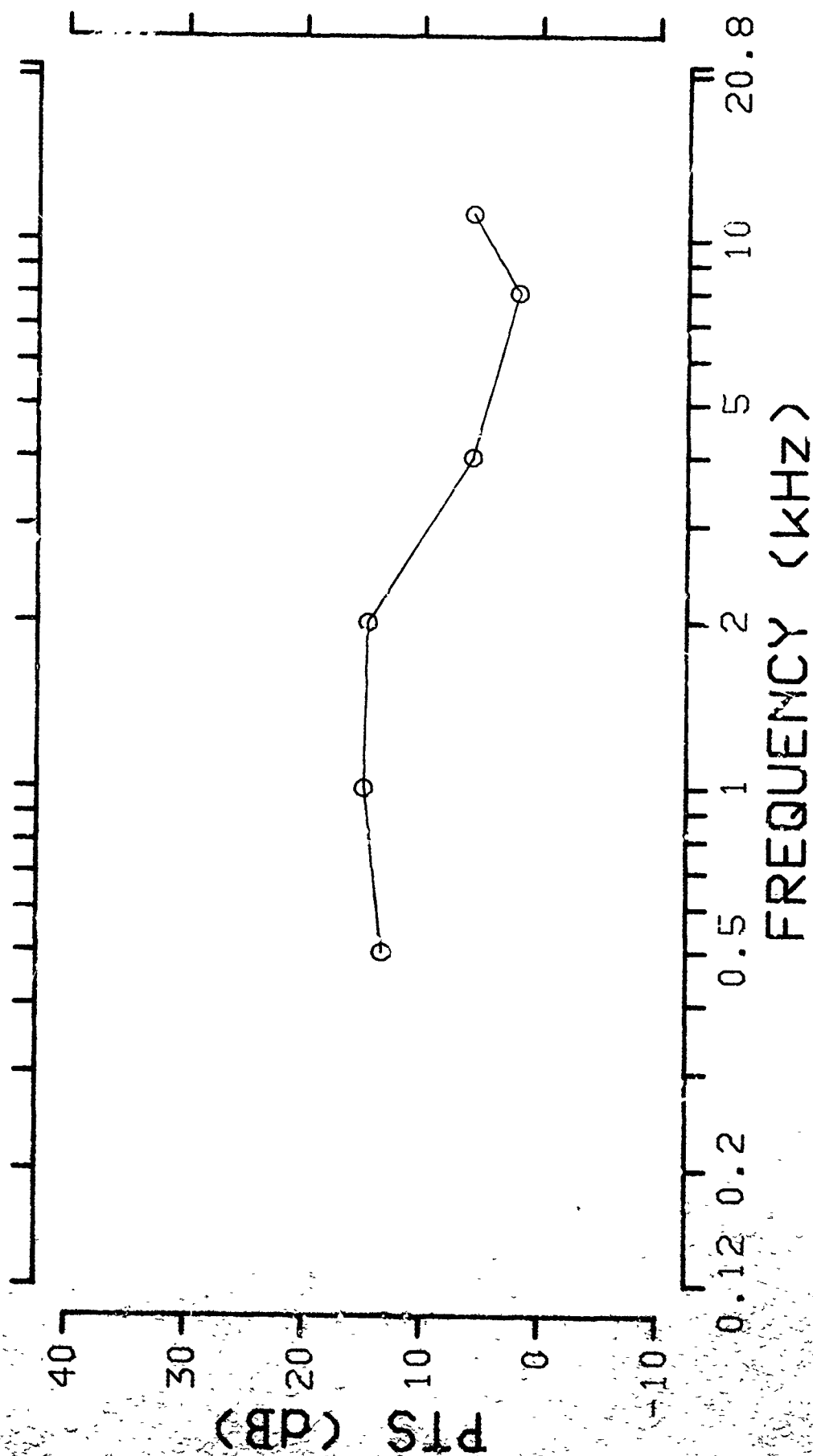
MEAN DATA (n=6) - 150 dB 100X 1/M



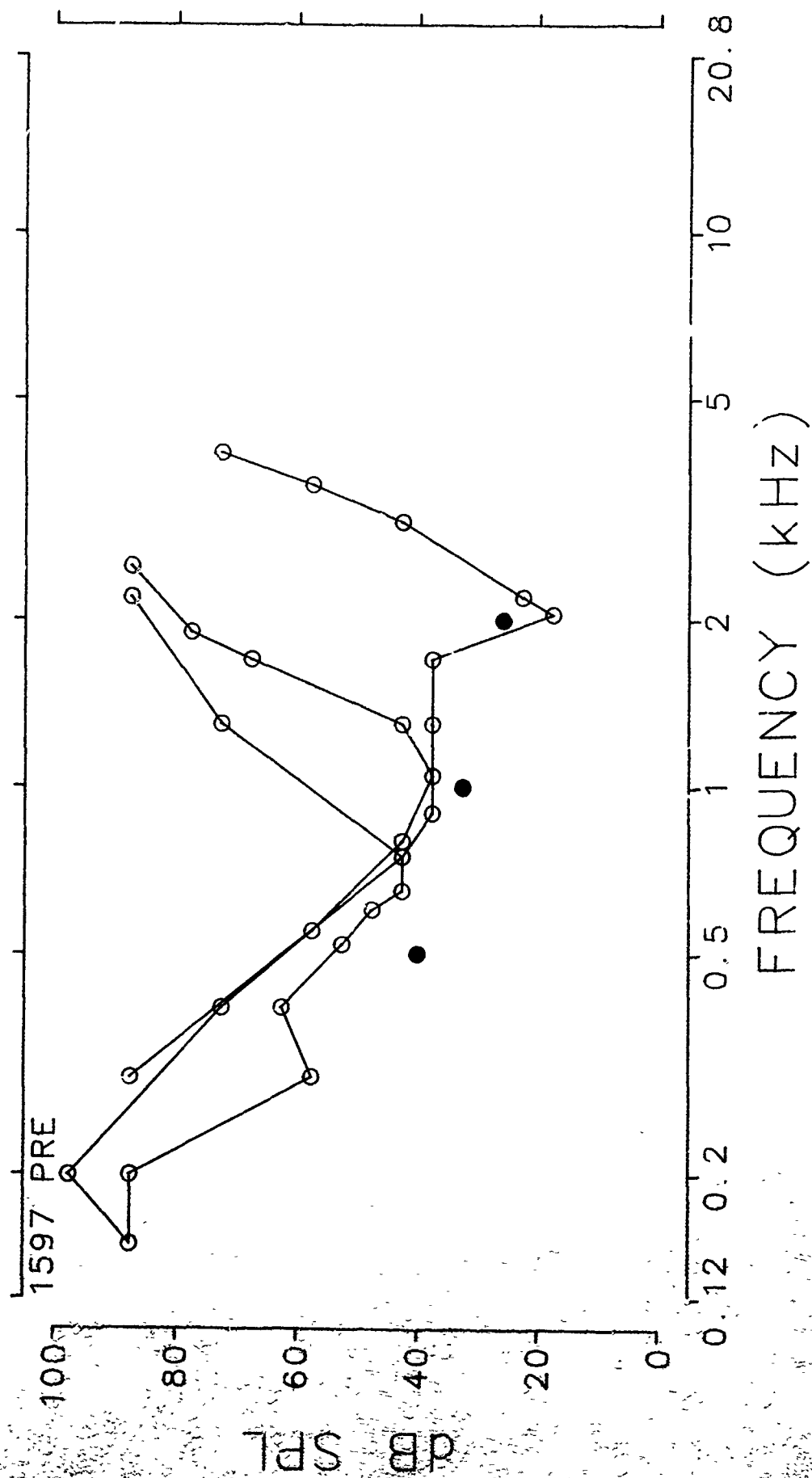
The Pre and Postexposure Tuning Curves for
Individual Animals in this Exposure Group.

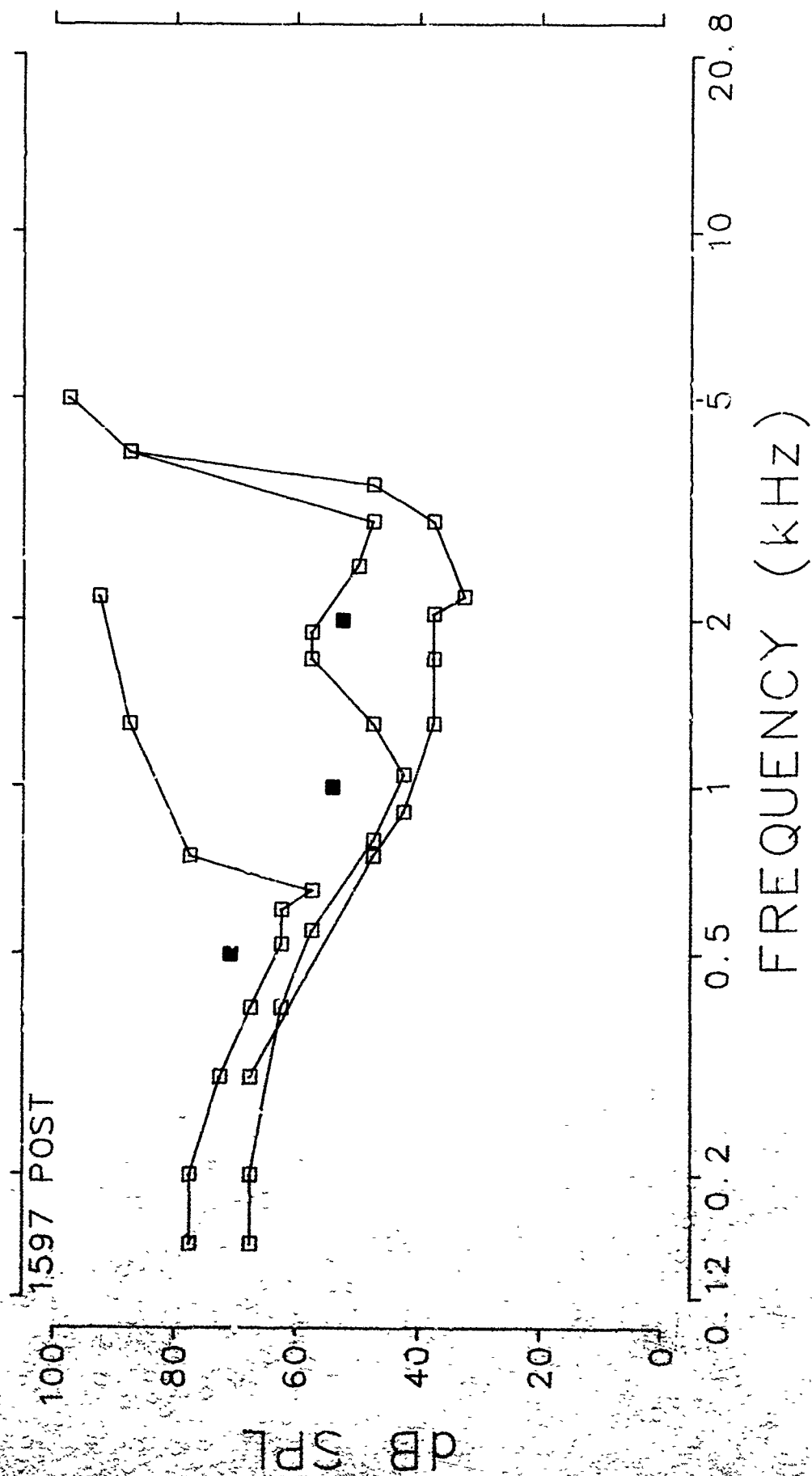
The solid symbol represents the threshold of the probe tone.

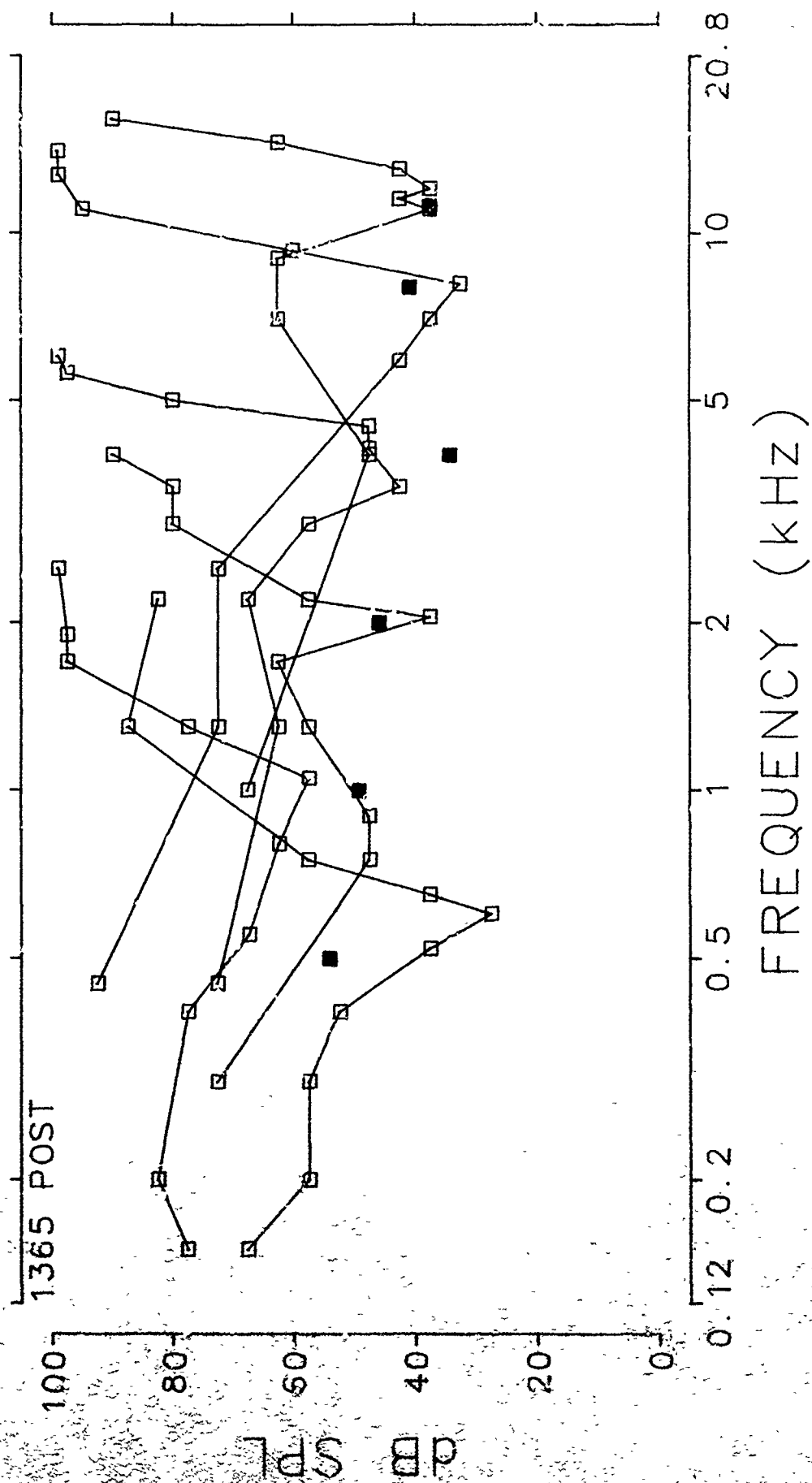
MEAN DATA (n=6) - 150 dB 100X 1/M

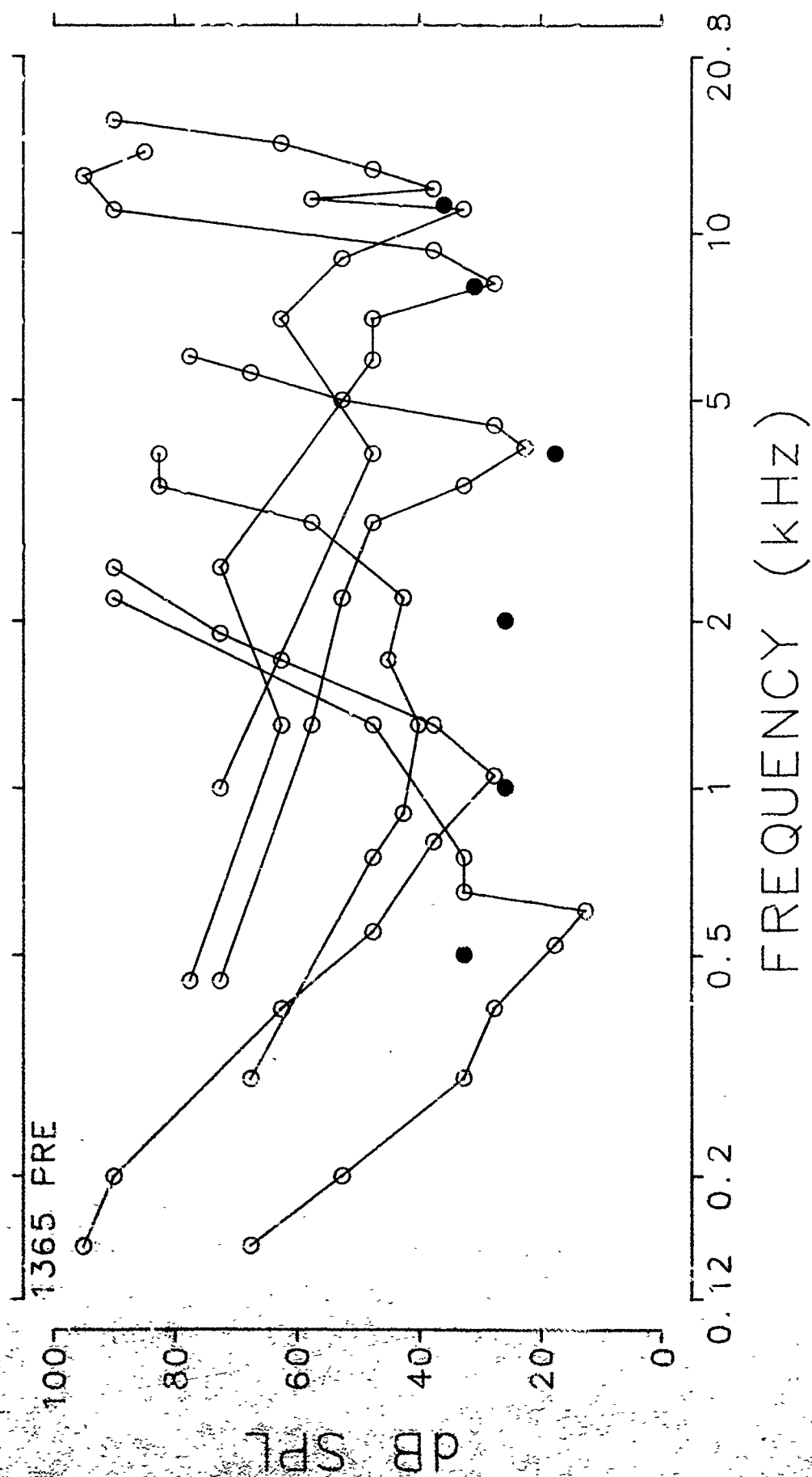


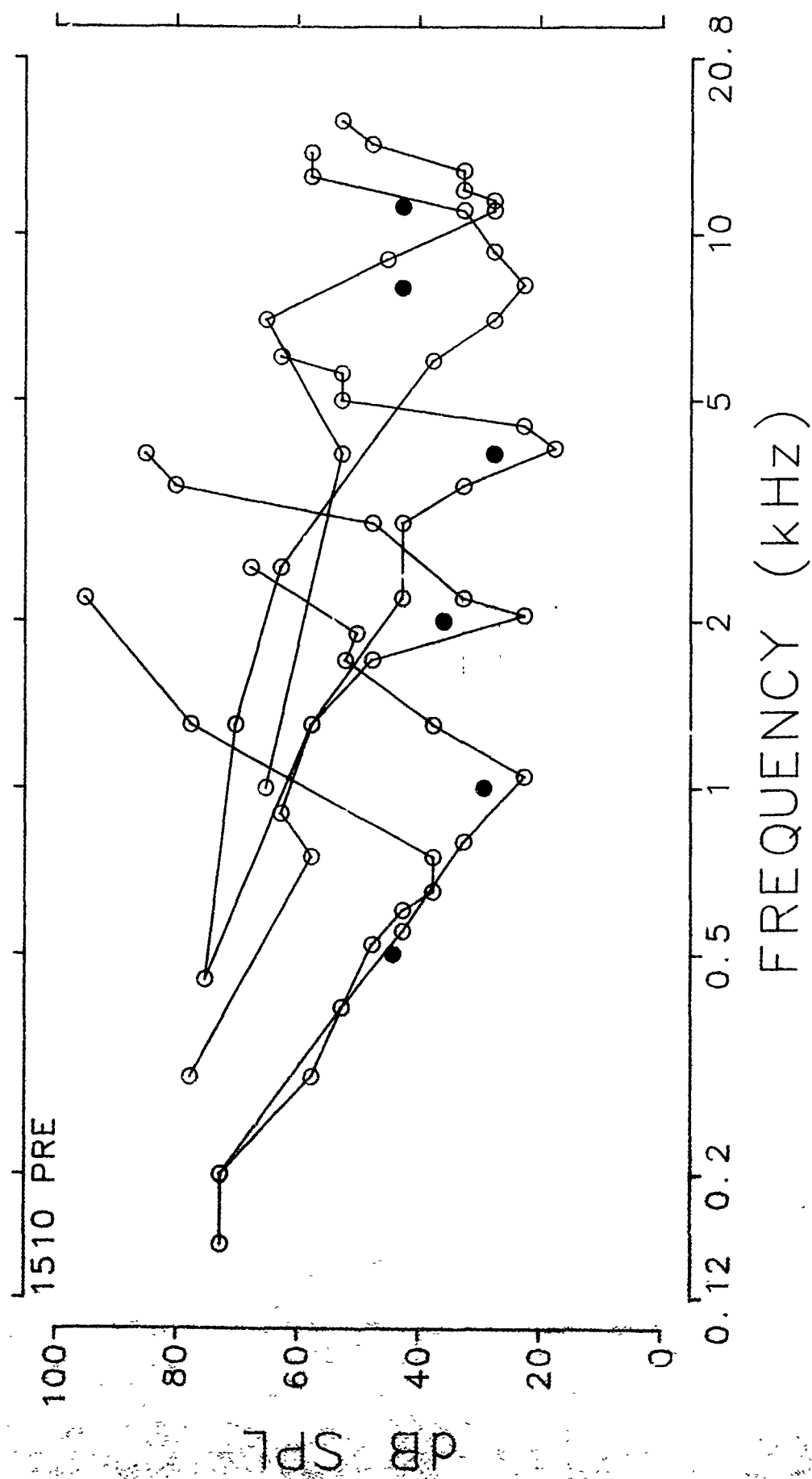
The Group Mean Permanent Threshold Shift (PTS)
for all Test Frequencies

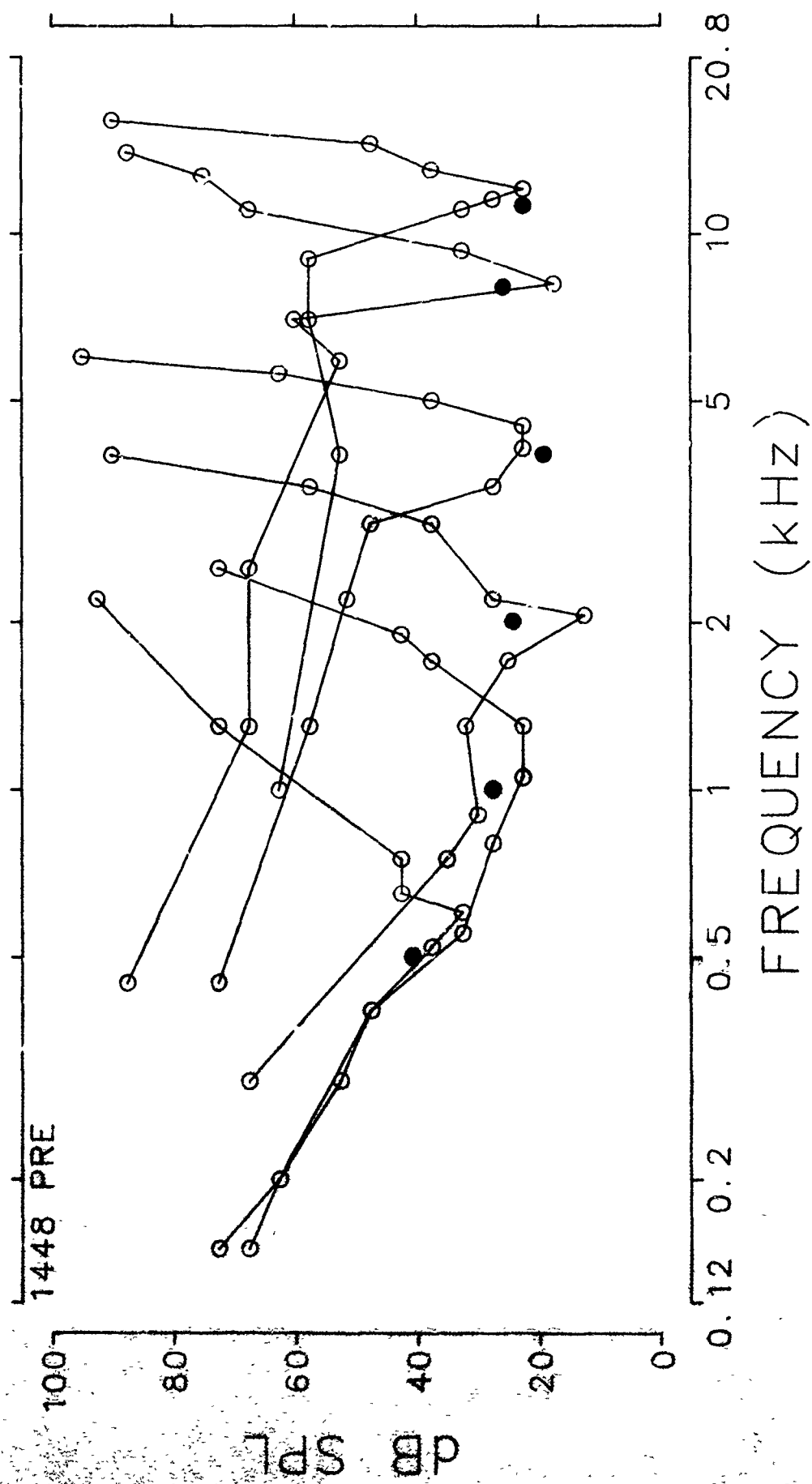


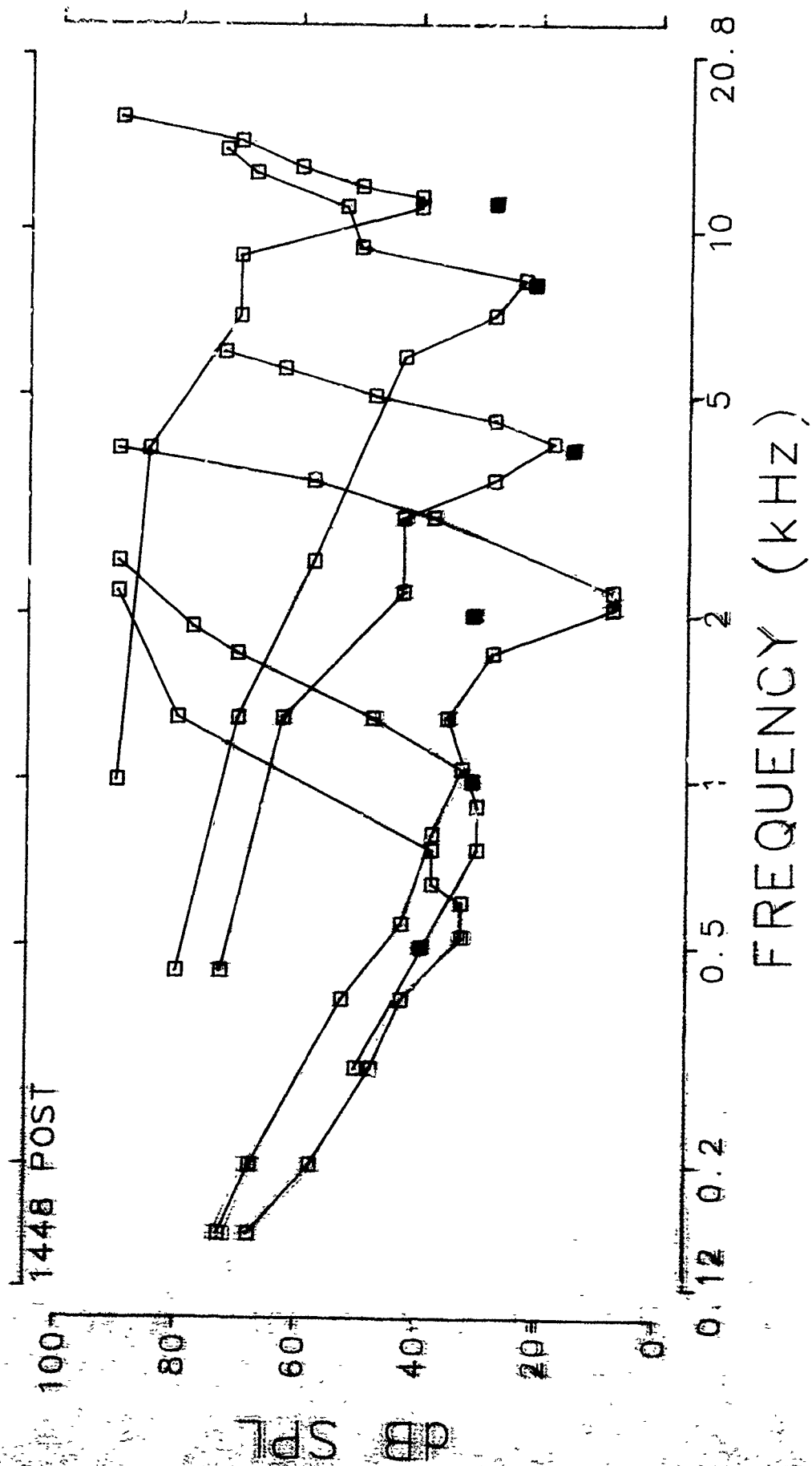


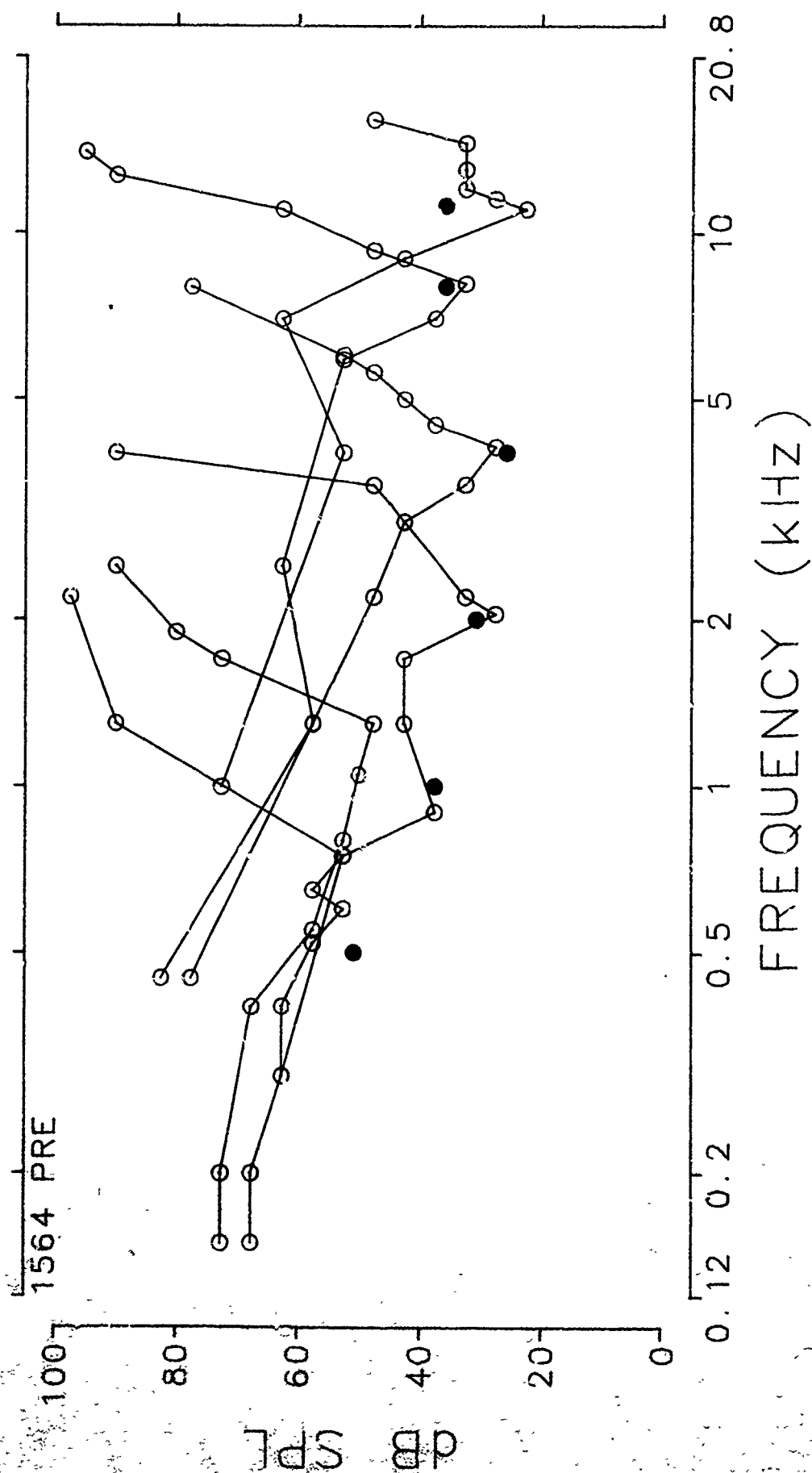


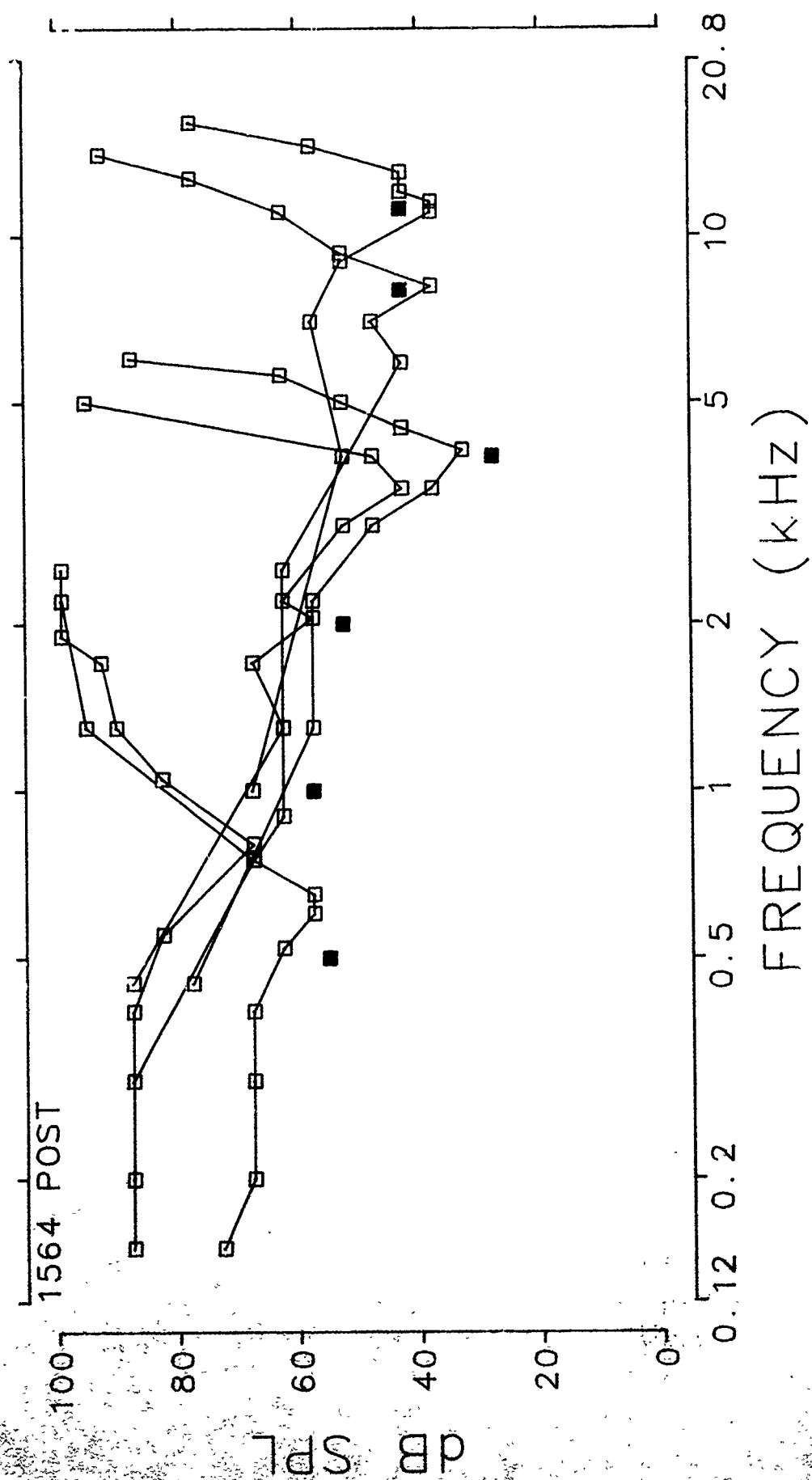












SHOCK TUBE EXPOSURE
150 dB, 100X, 1/MIN

TOTAL NUMBER OF COCHLEAR SENSORY CELLS MISSING

| ANIMAL NUMBER | INNER HAIR CELLS | 1ST ROW OUTER HAIR CELLS | 2ND ROW OUTER HAIR CELLS | 3RD ROW OUTER HAIR CELLS | TOTAL OUTER HAIR CELLS |
|------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------------------------|
| R1365R | 4 | 138 | 429 | 119 | 686 |
| R1448R | 28 | 196 | 338 | 152 | 686 |
| R1452R | 213 | 1461 | 1357 | 1151 | 3969 |
| R1510R | 17 | 76 | 104 | 81 | 261 |
| R1539R | 38 | 98 | 595 | 143 | 836 |
| R1564R | 82 | 903 | 942 | 597 | 2442 |
| R1597R | 110 | 563 | 786 | 476 | 1825 |
| GROUP MEAN | 70 | | | | 1529 |
| S.D. | 73 | | | | 1316 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND LENGTHS OF THE
COCHLEA CENTERED AT THE FREQUENCIES INDICATED

| GROUP MEANS | OCTAVE BAND CENTER FREQUENCY | INNER HAIR CELLS | OUTER HAIR CELLS |
|-------------|------------------------------------|------------------------|------------------------|
| | 0.125 kHz | 3.3 | 75.6 |
| | 0.25 kHz | 1.9 | 59.3 |
| | 0.5 kHz | 2.7 | 202.7 |
| | 1 kHz | 15.3 | 432.9 |
| | 2 kHz | 19.6 | 503.1 |
| | 4 kHz | 16.7 | 217.6 |
| | 8 kHz | 9.6 | 20.6 |
| | 16 kHz | 1.0 | 17.1 |

STANDARD DEVIATIONS

| | | |
|-----------|------|-------|
| 0.125 kHz | 2.6 | 55.2 |
| 0.25 kHz | 2.0 | 90.6 |
| 0.5 kHz | 1.9 | 277.6 |
| 1 kHz | 29.4 | 346.5 |
| 2 kHz | 29.1 | 371.5 |
| 4 kHz | 16.9 | 287.9 |
| 8 kHz | 23.5 | 18.3 |
| 16 kHz | 1.0 | 14.1 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1365R | | | | | | | |
| 0.125 kHz | 1 | 8 | 26 | 15 | 49 | 0 | 1 |
| 0.25 kHz | 0 | 3 | 1 | 3 | 7 | 0 | 0 |
| 0.5 kHz | 0 | 1 | 3 | 6 | 10 | 0 | 0 |
| 1 kHz | 1 | 39 | 135 | 13 | 187 | 1 | 2 |
| 2 kHz | 1 | 81 | 217 | 65 | 363 | 1 | 2 |
| 4 kHz | 1 | 4 | 41 | 6 | 51 | 0 | 0 |
| 8 kHz | 0 | 0 | 1 | 2 | 3 | 0 | 0 |
| 16 kHz | 0 | 2 | 5 | 9 | 16 | 0 | 0 |
| TOTALS | 4 | 138 | 429 | 119 | 686 | 2 | 5 |
| CHINCHILLA R1448R | | | | | | | |
| 0.125 kHz | 8 | 22 | 64 | 57 | 143 | 0 | 0 |
| 0.25 kHz | 4 | 0 | 2 | 30 | 32 | 0 | 0 |
| 0.5 kHz | 3 | 8 | 9 | 11 | 28 | 2 | 0 |
| 1 kHz | 3 | 95 | 145 | 17 | 257 | 2 | 3 |
| 2 kHz | 3 | 60 | 109 | 18 | 187 | 5 | 2 |
| 4 kHz | 3 | 6 | 2 | 7 | 15 | 0 | 0 |
| 8 kHz | 4 | 2 | 3 | 8 | 13 | 0 | 0 |
| 16 kHz | 0 | 3 | 4 | 4 | 11 | 0 | 0 |
| TOTALS | 28 | 196 | 338 | 152 | 686 | 9 | 5 |
| CHINCHILLA R1452R | | | | | | | |
| 0.125 kHz | 3 | 14 | 20 | 26 | 60 | 0 | 0 |
| 0.25 kHz | 0 | 124 | 50 | 89 | 263 | 0 | 0 |
| 0.5 kHz | 5 | 338 | 316 | 124 | 778 | 1 | 11 |
| 1 kHz | 81 | 340 | 341 | 338 | 1019 | 123 | 109 |
| 2 kHz | 79 | 340 | 341 | 340 | 1021 | 164 | 136 |
| 4 kHz | 42 | 259 | 263 | 231 | 753 | 94 | 78 |
| 8 kHz | 1 | 37 | 16 | 2 | 55 | 0 | 0 |
| 16 kHz | 2 | 9 | 10 | 1 | 20 | 1 | 0 |
| TOTALS | 213 | 1461 | 1357 | 1151 | 3969 | 383 | 334 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1510R | | | | | | | |
| 0.125 kHz | 5 | 11 | 6 | 14 | 31 | 2 | 1 |
| 0.25 kHz | 1 | 11 | 7 | 15 | 33 | 0 | 0 |
| 0.5 kHz | 2 | 9 | 14 | 11 | 34 | 0 | 0 |
| 1 kHz | 3 | 18 | 36 | 8 | 62 | 0 | 3 |
| 2 kHz | 1 | 7 | 6 | 6 | 19 | 0 | 2 |
| 4 kHz | 3 | 1 | 7 | 12 | 20 | 0 | 0 |
| 8 kHz | 0 | 8 | 19 | 5 | 32 | 0 | 0 |
| 16 kHz | 2 | 9 | 9 | 10 | 28 | 1 | 0 |
| TOTALS | 17 | 76 | 104 | 81 | 261 | 3 | 6 |

CHINCHILLA R1539R

| | | | | | | | |
|-----------|----|----|-----|-----|-----|----|----|
| 0.125 kHz | 4 | 0 | 3 | 12 | 15 | 0 | 0 |
| 0.25 kHz | 5 | 13 | 4 | 12 | 29 | 0 | 0 |
| 0.5 kHz | 5 | 6 | 25 | 7 | 38 | 0 | 0 |
| 1 kHz | 2 | 23 | 171 | 15 | 209 | 4 | 6 |
| 2 kHz | 11 | 25 | 279 | 57 | 361 | 11 | 9 |
| 4 kHz | 9 | 11 | 89 | 22 | 122 | 0 | 0 |
| 8 kHz | 1 | 10 | 5 | 6 | 21 | 0 | 0 |
| 16 kHz | 1 | 10 | 19 | 12 | 41 | 0 | 0 |
| TOTALS | 38 | 98 | 595 | 143 | 836 | 15 | 15 |

CHINCHILLA R1564R

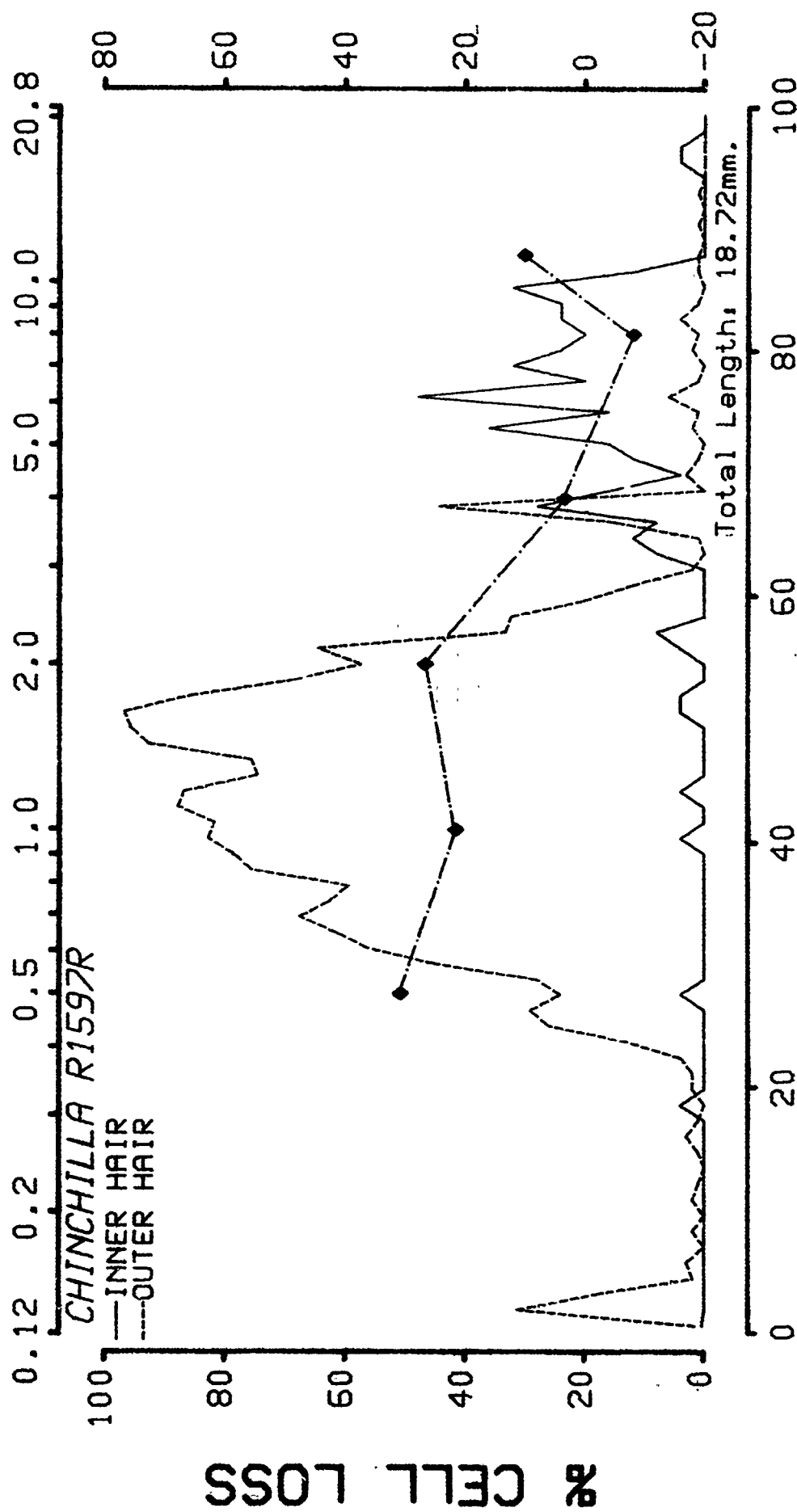
| | | | | | | | |
|-----------|----|-----|-----|-----|------|-----|-----|
| 0.125 kHz | 1 | 65 | 49 | 46 | 160 | 0 | 0 |
| 0.25 kHz | 2 | 5 | 8 | 26 | 39 | 1 | 2 |
| 0.5 kHz | 3 | 80 | 87 | 86 | 253 | 1 | 3 |
| 1 kHz | 15 | 285 | 255 | 57 | 597 | 34 | 25 |
| 2 kHz | 37 | 331 | 328 | 241 | 900 | 106 | 80 |
| 4 kHz | 24 | 136 | 213 | 139 | 488 | 55 | 69 |
| 8 kHz | 0 | 0 | 1 | 2 | 3 | 0 | 0 |
| 16 kHz | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| TOTALS | 82 | 903 | 942 | 597 | 2442 | 197 | 179 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1597R | | | | | | | |
| 0.125 kHz | 1 | 13 | 21 | 37 | 71 | 0 | 0 |
| 0.25 kHz | 1 | 3 | 4 | 5 | 12 | 0 | 0 |
| 0.5 kHz | 1 | 92 | 169 | 17 | 278 | 0 | 1 |
| 1 kHz | 2 | 256 | 252 | 191 | 699 | 0 | 2 |
| 2 kHz | 5 | 166 | 302 | 203 | 671 | 0 | 0 |
| 4 kHz | 35 | 23 | 31 | 20 | 74 | 6 | 6 |
| 8 kHz | 63 | 10 | 6 | 1 | 17 | 3 | 0 |
| 16 kHz | 2 | 0 | 1 | 2 | 3 | 0 | 0 |
| TOTALS | 110 | 563 | 786 | 476 | 1825 | 9 | 9 |

Cochleograms and PTS Audiograms
for Individual Animals

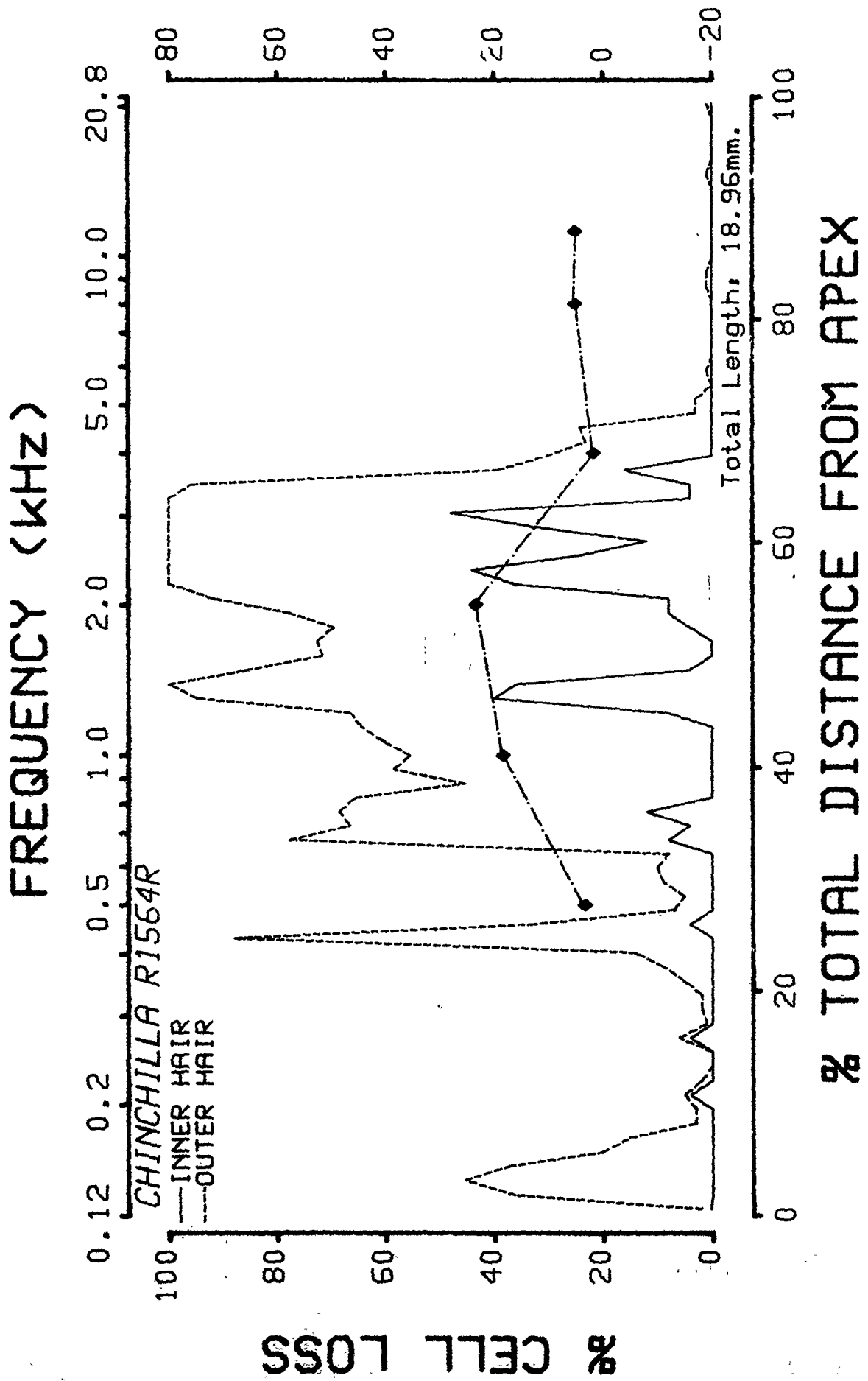
FREQUENCY (kHz)



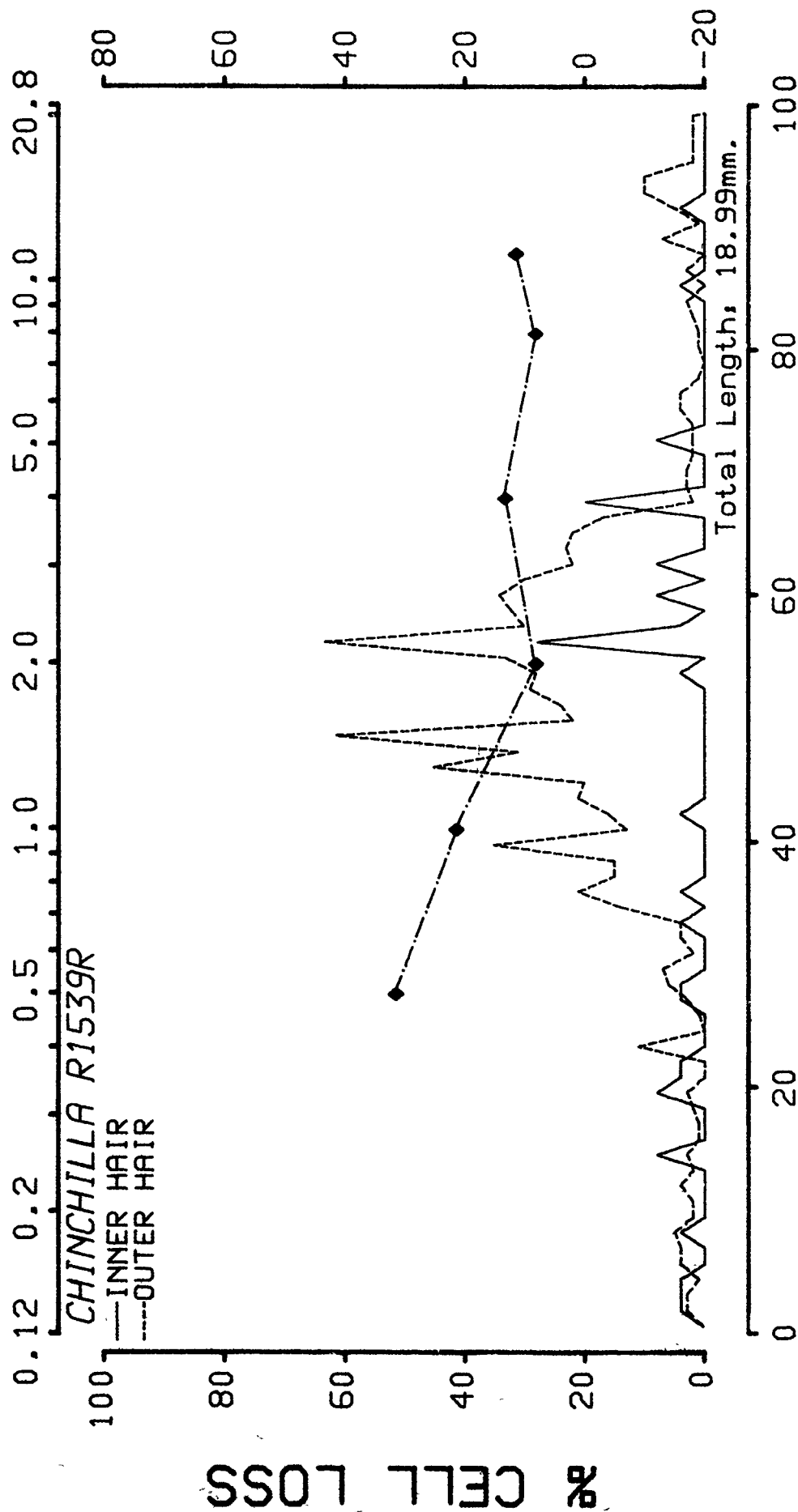
% TOTAL DISTANCE FROM APEX

% CELL LOSS

PTS (dB)



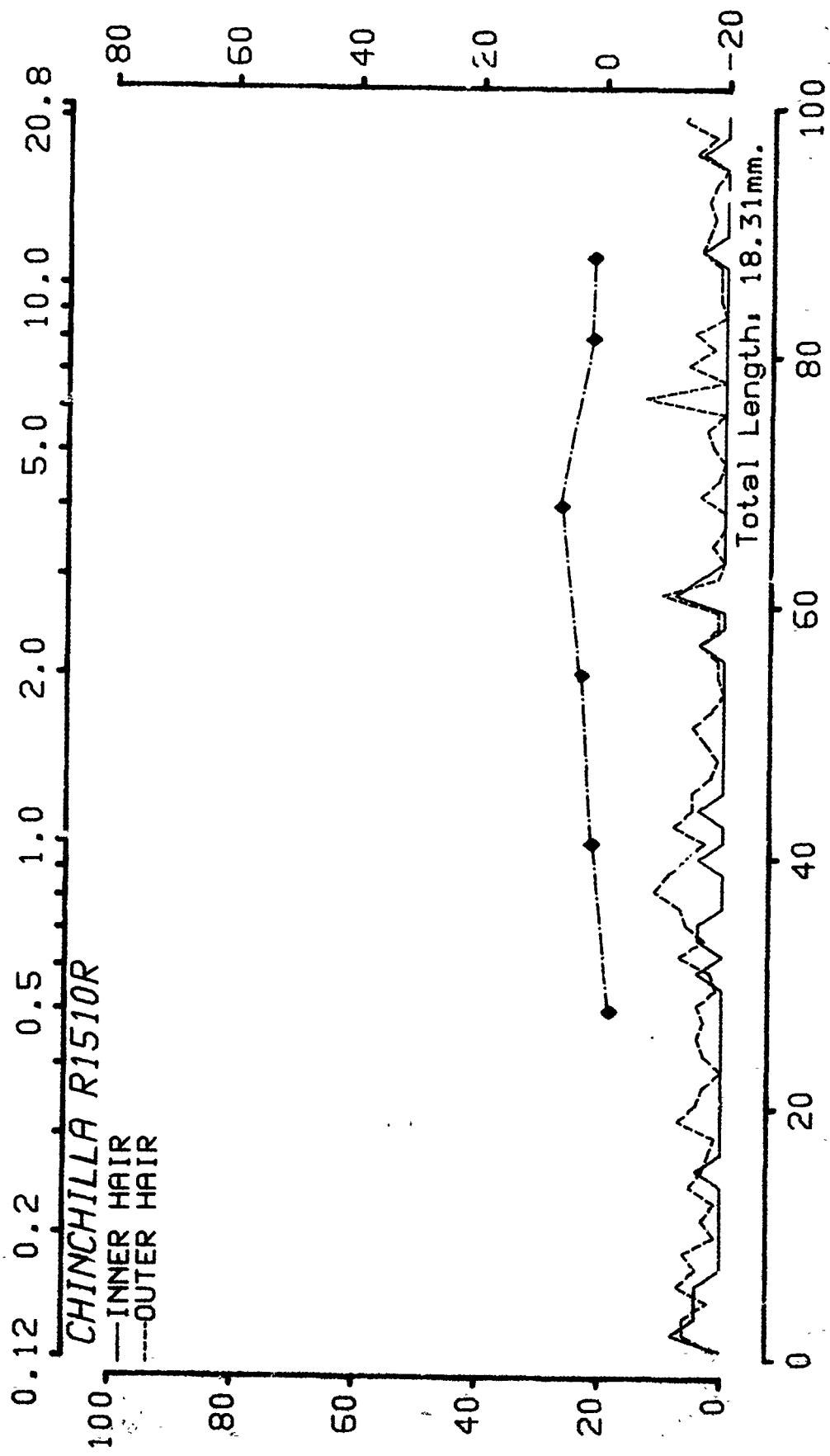
FREQUENCY (kHz)



% CELL LOSS

% TOTAL DISTANCE FROM APEX

FREQUENCY (KHz)

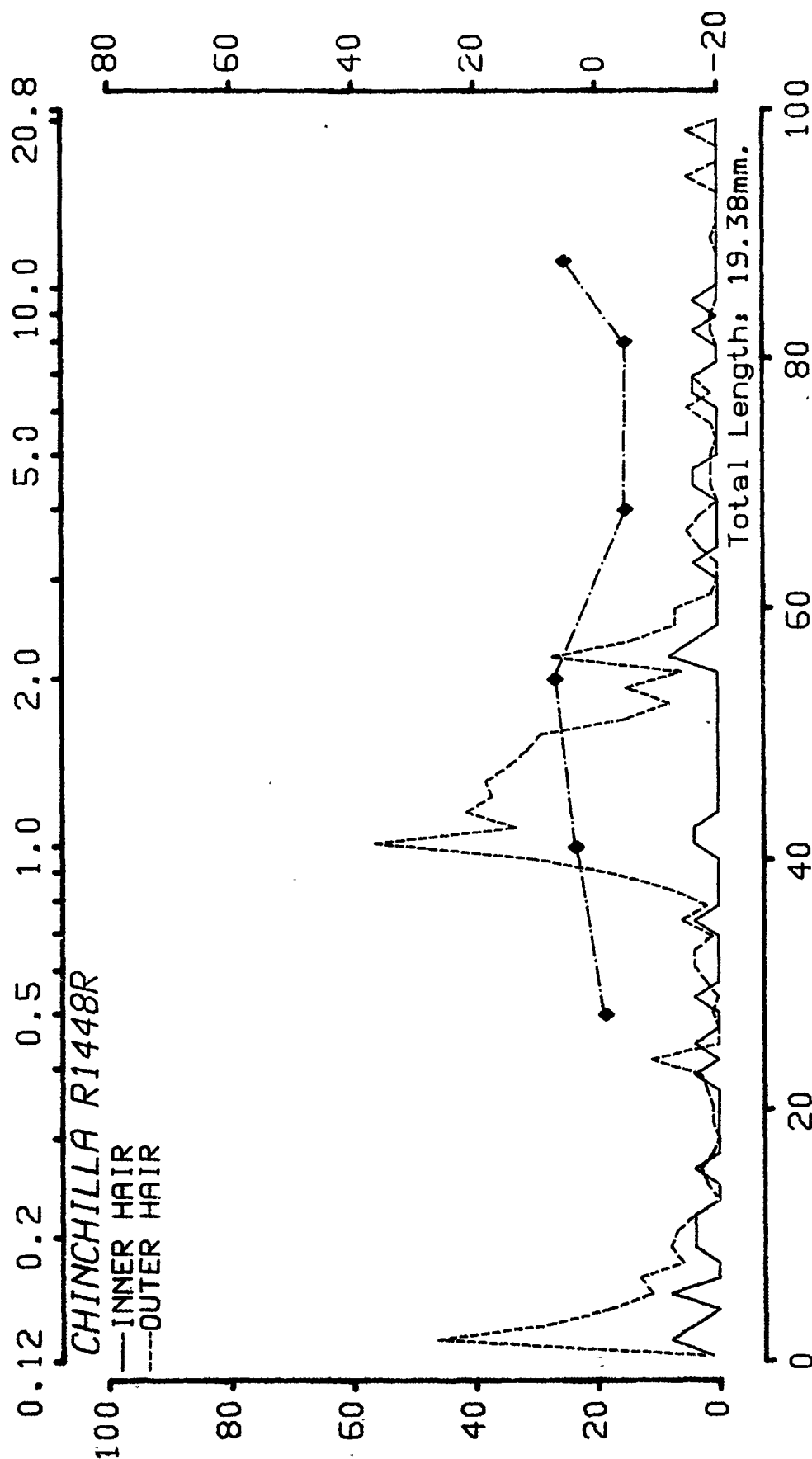


% CELL LOSS

PTS (dB)

% TOTAL DISTANCE FROM APEX

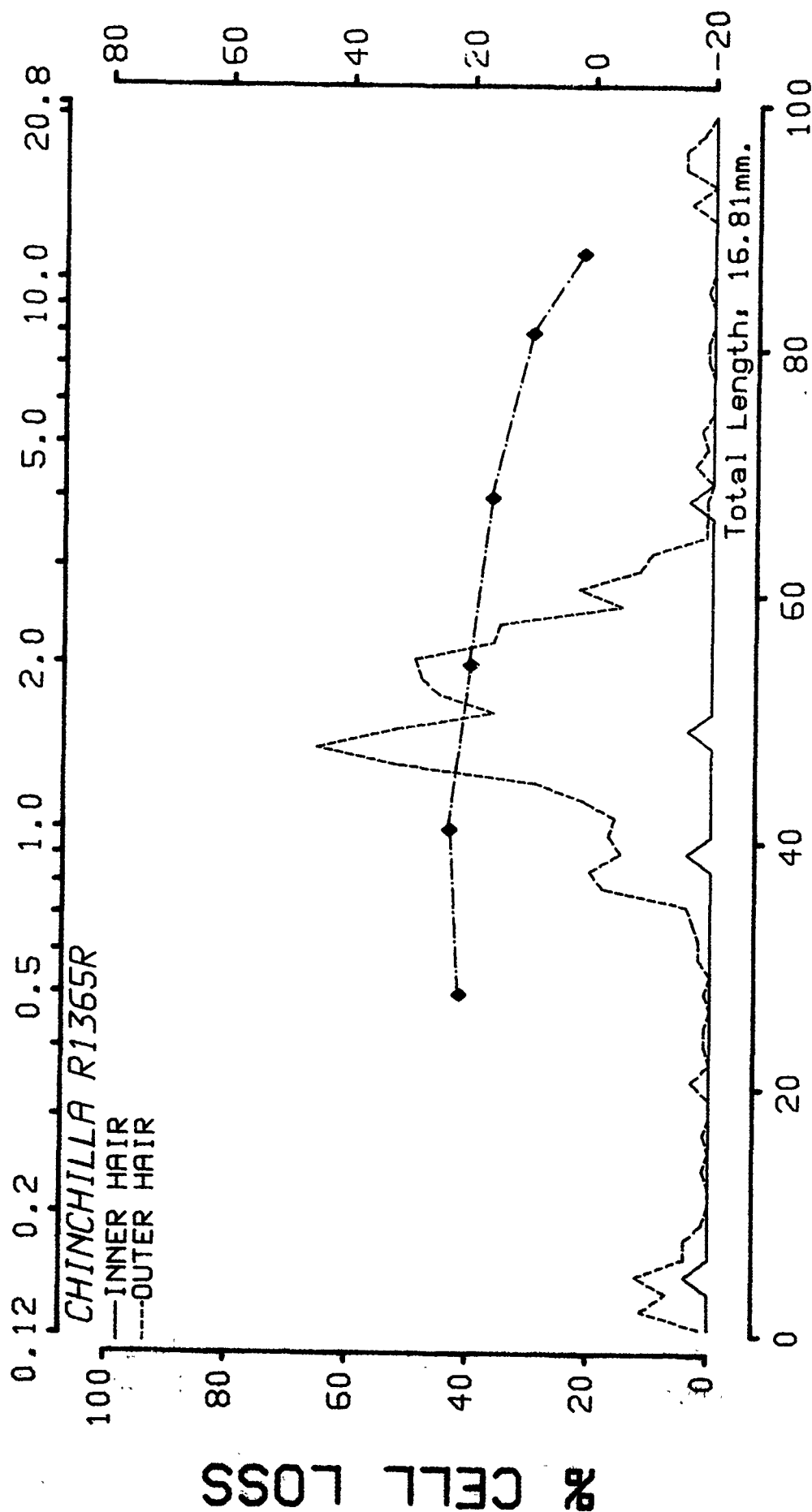
FREQUENCY (kHz)

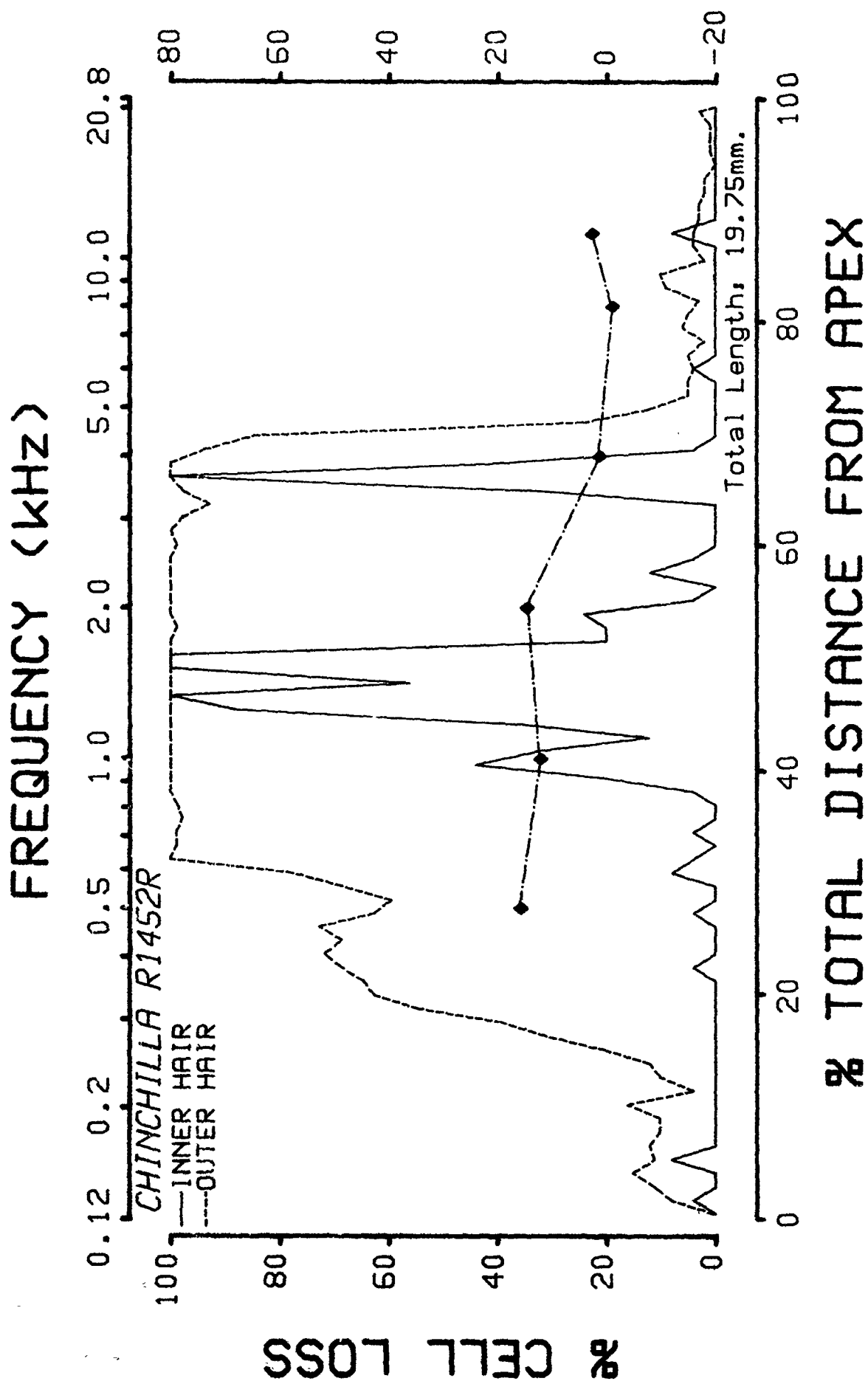


% CELL LOSS

% TOTAL DISTANCE FROM APEX

FREQUENCY (kHz)





Summary Data for the Group Exposed to:

155 dB, 1X

Animal

| | | |
|------|---|--|
| 1933 | - | Completed the Entire Protocol |
| 1961 | - | Completed the Entire Protocol |
| 1975 | - | Completed the Entire Protocol |
| 2016 | - | Completed the Entire Protocol |
| 2076 | - | Completed the Entire Protocol |
| 1396 | - | Only Histological Data Included in Means |
| 1337 | - | Only Histological Data Included in Means |

PRE-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|-------|------|------|-------|
| 1933 | 12.5 | 7.5 | 15.8 | 4.2 | 20.8 | 19.2 | ***** |
| 1961 | 14.2 | 9.2 | 17.5 | 10.8 | 20.8 | 22.5 | ***** |
| 1975 | 7.5 | 0.8 | 5.8 | -0.8 | 5.8 | 15.8 | ***** |
| 2016 | 5.8 | -2.5 | 7.5 | -10.8 | 5.8 | 19.2 | 29.2 |
| 2076 | 12.5 | 9.2 | 12.5 | 20.8 | 10.8 | 15.8 | ***** |
| Mean | 10.5 | 4.8 | 11.8 | 4.8 | 12.8 | 18.5 | 29.2 |
| S.D. | 3.6 | 5.3 | 5.1 | 11.9 | 7.6 | 2.8 | ***** |

POST-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1933 | 5.8 | 7.5 | 19.2 | 0.8 | 25.8 | 17.5 | ***** |
| 1961 | 20.8 | 12.5 | 15.8 | 10.8 | 12.5 | 20.8 | ***** |
| 1975 | 7.5 | 4.2 | 4.2 | 0.8 | 9.2 | 22.5 | ***** |
| 2016 | 2.5 | -2.5 | 4.2 | -0.8 | 0.8 | 15.8 | ***** |
| 2076 | 10.8 | -0.8 | 7.5 | 19.2 | -2.5 | 4.2 | ***** |
| Mean | 9.5 | 4.2 | 10.2 | 6.2 | 9.2 | 16.2 | ***** |
| S.D. | 7.0 | 6.1 | 6.9 | 8.6 | 11.1 | 7.2 | ***** |

PERMANENT THRESHOLD SHIFT (dB)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|-------|------|------|-------|-------|-------|
| 1933 | -6.7 | 0.0 | 3.3 | -3.3 | 5.0 | -1.7 | ***** |
| 1961 | 6.7 | 3.3 | -1.7 | 0.0 | -8.3 | -1.7 | ***** |
| 1975 | 0.0 | 3.3 | -1.7 | 1.7 | 3.3 | 6.7 | ***** |
| 2016 | -3.3 | 0.0 | -3.3 | 10.0 | -5.0 | -3.3 | ***** |
| 2076 | -1.7 | -10.0 | -5.0 | -1.7 | -13.3 | -11.7 | ***** |
| Mean | -1.0 | -0.7 | -1.7 | 1.3 | -3.7 | -2.3 | ***** |
| S.D. | 4.9 | 5.5 | 3.1 | 5.2 | 7.8 | 6.5 | ***** |

155 dB 1X

TEMPORARY THRESHOLD SHIFT (dB)

| | | Frequency 0.5 kHz | | | | |
|-----------|------|-------------------|------|-------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1933 | 0.0 | 0.0 | -5.0 | -5.0 | 0.0 | 0.0 |
| 1961 | 3.3 | -1.7 | 8.3 | -1.7 | -1.7 | 8.3 |
| 1975 | -5.0 | -5.0 | -5.0 | -5.0 | -5.0 | -5.0 |
| 2016 | -3.3 | -3.3 | 1.7 | ***** | -3.3 | 1.7 |
| 2076 | -5.0 | 0.0 | -5.0 | -5.0 | 0.0 | 0.0 |
| Mean | -2.0 | -2.0 | -1.0 | -4.2 | -2.0 | 1.0 |
| S.D. | 3.6 | 2.2 | 6.0 | 1.7 | 2.2 | 4.8 |

| | | Frequency 2.0 kHz | | | | |
|-----------|------|-------------------|-----|-------|------|-----|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1933 | 1.7 | 6.7 | 1.7 | -3.3 | 1.7 | 6.7 |
| 1961 | 5.0 | 0.0 | 0.0 | -5.0 | 0.0 | 5.0 |
| 1975 | -3.3 | -3.3 | 1.7 | -3.3 | -3.3 | 1.7 |
| 2016 | 0.0 | 0.0 | 5.0 | ***** | 0.0 | 5.0 |
| 2076 | 0.0 | 5.0 | 5.0 | -5.0 | 0.0 | 5.0 |
| Mean | 0.7 | 1.7 | 2.7 | -4.2 | -0.3 | 4.7 |
| S.D. | 3.0 | 4.1 | 2.2 | 1.0 | 1.8 | 1.8 |

| | | Frequency 8.0 kHz | | | | |
|-----------|------|-------------------|------|-------|-------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1933 | 1.7 | -3.3 | -3.3 | 6.7 | -8.3 | 6.7 |
| 1961 | -3.3 | -13.3 | -8.3 | -3.3 | -8.3 | -3.3 |
| 1975 | 26.7 | 11.7 | 21.7 | -3.3 | 1.7 | 26.7 |
| 2016 | -3.3 | -3.3 | 6.7 | ***** | -3.3 | 6.7 |
| 2076 | 6.7 | 11.7 | -3.3 | -3.3 | -13.3 | 11.7 |
| Mean | 5.7 | 0.7 | 2.7 | -0.8 | -6.3 | 9.7 |
| S.D. | 12.4 | 10.8 | 11.9 | 5.0 | 5.7 | 10.9 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB LX

Probe Frequency: 0.5 kHz

| Masker (kHz): | 0.150 | 0.200 | 0.300 | 0.400 | 0.520 | 0.600 | 0.650 | 0.750 | 1.300 | 2.200 |
|------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1933 (2.62) | 62.5 | 57.5 | 47.5 | 27.5 | 27.5 | 17.5 | 22.5 | 27.5 | 72.5 | 82.5 |
| 1961 (1.73) | 57.5 | 57.5 | 52.5 | 47.5 | 32.5 | 27.5 | 27.5 | 32.5 | 62.5 | 82.5 |
| 1975 (1.49) | 72.5 | 62.5 | 52.5 | 37.5 | 27.5 | 27.5 | 27.5 | 37.5 | 62.5 | 82.5 |
| 2016 (1.77) | 77.5 | 67.5 | 52.5 | 52.5 | 32.5 | 37.5 | 32.5 | 42.5 | 67.5 | 82.5 |
| 2076 (4.55) | 62.5 | 62.5 | 47.5 | 37.5 | 37.5 | 22.5 | 17.5 | 32.5 | 57.5 | 82.5 |
| Mean (2.43) | 66.5 | 61.5 | 50.5 | 40.5 | 31.5 | 26.5 | 25.5 | 34.5 | 64.5 | 82.5 |
| S.D. (1.26) | 8.2 | 4.2 | 2.7 | 9.7 | 4.2 | 7.4 | 5.7 | 5.7 | 5.7 | 0.0 |

| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
|------------------|---------------|------|------|------|------|------|------|------|------|------|
| 1933 (4.36) | 72.5 | 67.5 | 47.5 | 32.5 | 27.5 | 32.5 | 22.5 | 32.5 | 62.5 | 77.5 |
| 1961 (1.99) | 62.5 | 62.5 | 47.5 | 42.5 | 37.5 | 27.5 | 27.5 | 32.5 | 62.5 | 82.5 |
| 1975 (2.62) | 67.5 | 57.5 | 47.5 | 27.5 | 27.5 | 17.5 | 17.5 | 27.5 | 57.5 | 72.5 |
| 2016 (3.33) | 62.5 | 62.5 | 42.5 | 37.5 | 22.5 | 17.5 | 12.5 | 27.5 | 57.5 | 82.5 |
| 2076 (2.44) | 52.5 | 57.5 | 42.5 | 32.5 | 17.5 | 22.5 | 27.5 | 32.5 | 57.5 | 87.5 |
| Mean (2.95) | 63.5 | 61.5 | 45.5 | 34.5 | 26.5 | 23.5 | 21.5 | 30.5 | 59.5 | 80.5 |
| S.D. (0.93) | 7.4 | 4.2 | 2.7 | 5.7 | 7.4 | 6.5 | 6.5 | 2.7 | 2.7 | 5.7 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 1X

Probe Frequency: 1.0 kHz

Masker (kHz): 0.150 0.200 0.400 0.550 0.800 1.050 1.300 1.700 1.900 2.500

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| 1933 (1.77) | 67.5 | 72.5 | 52.5 | 47.5 | 32.5 | 27.5 | 37.5 | 57.5 | 72.5 | 82.5 |
| 1961 (0.93) | 72.5 | 72.5 | 52.5 | 42.5 | 27.5 | 27.5 | 27.5 | 47.5 | 57.5 | 82.5 |
| 1975 (1.84) | 77.5 | 72.5 | 52.5 | 47.5 | 27.5 | 22.5 | 32.5 | 47.5 | 62.5 | 82.5 |
| 2016 (2.47) | 72.5 | 72.5 | 62.5 | 52.5 | 37.5 | 22.5 | 32.5 | 47.5 | 57.5 | 82.5 |
| 2076 (2.55) | 72.5 | 72.5 | 52.5 | 42.5 | 32.5 | 22.5 | 37.5 | 52.5 | 57.5 | 82.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (1.91) | 72.5 | 72.5 | 54.5 | 46.5 | 31.5 | 24.5 | 33.5 | 50.5 | 61.5 | 82.5 |
| S.D. (0.66) | 3.5 | 0.0 | 4.5 | 4.2 | 4.2 | 2.7 | 4.2 | 4.5 | 6.5 | 0.0 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| 1933 (2.85) | 82.5 | 72.5 | 52.5 | 47.5 | 37.5 | 27.5 | 47.5 | 62.5 | 72.5 | 82.5 |
| 1961 (1.00) | 72.5 | 77.5 | 57.5 | 42.5 | 27.5 | 27.5 | 32.5 | 47.5 | 62.5 | 77.5 |
| 1975 (1.00) | 57.5 | 67.5 | 47.5 | 37.5 | 22.5 | 22.5 | 27.5 | 42.5 | 52.5 | 82.5 |
| 2016 (3.58) | 72.5 | 62.5 | 47.5 | 37.5 | 27.5 | 12.5 | 32.5 | 42.5 | 57.5 | 82.5 |
| 2076 (1.18) | 57.5 | 57.5 | 47.5 | 27.5 | 12.5 | 12.5 | 22.5 | 32.5 | 42.5 | 52.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (1.92) | 70.5 | 67.5 | 50.5 | 38.5 | 25.5 | 20.5 | 32.5 | 45.5 | 57.5 | 75.5 |
| S.D. (1.21) | 9.1 | 7.9 | 4.5 | 7.4 | 9.1 | 7.6 | 9.4 | 11.0 | 11.2 | 13.0 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 1X

Probe Frequency: 2.0 kHz

| Masker (kHz): | 0.300 | 0.750 | 0.900 | 1.300 | 1.700 | 2.050 | 2.200 | 3.000 | 3.500 | 4.000 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1933 (2.25) | 72.5 | 47.5 | 37.5 | 52.5 | 37.5 | 37.5 | 42.5 | 42.5 | 72.5 | 82.5 |
| 1961 (4.57) | 77.5 | 47.5 | 47.5 | 52.5 | 37.5 | 27.5 | 42.5 | 37.5 | 47.5 | 77.5 |
| 1975 (4.57) | 72.5 | 52.5 | 37.5 | 52.5 | 32.5 | 22.5 | 37.5 | 47.5 | 72.5 | 82.5 |
| 2016 (2.77) | 67.5 | 47.5 | 37.5 | 32.5 | 32.5 | 22.5 | 27.5 | 42.5 | 52.5 | 77.5 |
| 2076 (2.61) | 72.5 | 47.5 | 42.5 | 57.5 | 42.5 | 37.5 | 42.5 | 67.5 | 82.5 | 82.5 |
| Mean | (3.35) | 72.5 | 48.5 | 49.5 | 36.5 | 29.5 | 38.5 | 47.5 | 65.5 | 80.5 |
| S.D. | (1.12) | 3.5 | 2.2 | 9.7 | 4.2 | 7.6 | 6.5 | 11.7 | 14.8 | 2.7 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1933 (3.55) | 77.5 | 57.5 | 42.5 | 22.5 | 47.5 | 22.5 | 37.5 | 42.5 | 57.5 | 67.5 |
| 1961 (1.42) | 77.5 | 52.5 | 42.5 | 52.5 | 37.5 | 32.5 | 37.5 | 42.5 | 57.5 | 82.5 |
| 1975 (*****) | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 2016 (4.57) | 62.5 | 32.5 | 32.5 | 32.5 | 17.5 | 7.5 | 22.5 | 27.5 | 32.5 | 47.5 |
| 2076 (3.42) | 57.5 | 32.5 | 27.5 | 27.5 | 27.5 | 17.5 | 22.5 | 57.5 | 72.5 | 82.5 |
| Mean | (3.24) | 68.7 | 43.7 | 33.8 | 32.5 | 20.0 | 30.0 | 42.5 | 55.0 | 70.0 |
| S.D. | (1.32) | 10.3 | 13.1 | 13.1 | 12.9 | 10.4 | 8.7 | 12.2 | 16.6 | 16.6 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 1X

Probe Frequency: 4.0 kHz

| Masker (kHz): | 0.450 | 1.300 | 2.200 | 3.000 | 3.500 | 4.100 | 4.500 | 5.000 | 5.600 | 6.000 |
|------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1933 (4.10) | 72.5 | 47.5 | 57.5 | 37.5 | 32.5 | 22.5 | 32.5 | 42.5 | 47.5 | 67.5 |
| 1961 (2.11) | 77.5 | 52.5 | 57.5 | 37.5 | 27.5 | 27.5 | 32.5 | 47.5 | 47.5 | 57.5 |
| 1975 (6.77) | 72.5 | 52.5 | 52.5 | 42.5 | 27.5 | 12.5 | 32.5 | 42.5 | 62.5 | 77.5 |
| 2016 (4.42) | 77.5 | 47.5 | 47.5 | 32.5 | 12.5 | 7.5 | 27.5 | 37.5 | 27.5 | 42.5 |
| 2076 (2.47) | 67.5 | 52.5 | 57.5 | 47.5 | 42.5 | 37.5 | 42.5 | 57.5 | 52.5 | 62.5 |
| Mean (3.97) | 73.5 | 50.5 | 54.5 | 39.5 | 28.5 | 21.5 | 33.5 | 45.5 | 47.5 | 61.5 |
| S.D. (1.85) | 4.2 | 2.7 | 4.5 | 5.7 | 10.8 | 11.9 | 5.5 | 7.6 | 12.7 | 12.9 |

| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
|------------------|---------------|------|------|------|------|------|------|------|------|------|
| 1933 (4.10) | 82.5 | 67.5 | 62.5 | 57.5 | 47.5 | 37.5 | 47.5 | 62.5 | 77.5 | 87.5 |
| 1961 (4.10) | 77.5 | 52.5 | 57.5 | 37.5 | 32.5 | 22.5 | 32.5 | 47.5 | 47.5 | 62.5 |
| 1975 (3.49) | 82.5 | 47.5 | 47.5 | 32.5 | 17.5 | 12.5 | 22.5 | 32.5 | 47.5 | 82.5 |
| 2016 (3.13) | 82.5 | 42.5 | 42.5 | 27.5 | 17.5 | 2.5 | 7.5 | 12.5 | 22.5 | 32.5 |
| 2076 (1.40) | 62.5 | 42.5 | 42.5 | 42.5 | 27.5 | 27.5 | 32.5 | 32.5 | 32.5 | 62.5 |
| Mean (3.24) | 77.5 | 50.5 | 50.5 | 39.5 | 28.5 | 20.5 | 28.5 | 37.5 | 45.5 | 65.5 |
| S.D. (1.11) | 8.7 | 10.4 | 9.1 | 11.5 | 12.4 | 13.5 | 14.7 | 18.7 | 20.8 | 21.7 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB LX

Probe Frequency: 8.0 kHz

Masker (kHz): 0.450 1.300 2.500 5.900 7.000 8.100 9.300 11.000 12.700 14.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| 1933 (4.31) | 82.5 | 57.5 | 57.5 | 42.5 | 32.5 | 22.5 | 37.5 | 72.5 | 82.5 | 82.5 |
| 1961 (3.94) | 72.5 | 57.5 | 57.5 | 37.5 | 27.5 | 22.5 | 52.5 | 57.5 | 77.5 | 82.5 |
| 1975 (2.52) | 67.5 | 57.5 | 37.5 | 22.5 | 12.5 | 17.5 | 27.5 | 37.5 | 42.5 | 82.5 |
| 2016 (5.29) | 82.5 | 67.5 | 62.5 | 47.5 | 42.5 | 27.5 | 42.5 | 82.5 | 82.5 | 82.5 |
| 2076 (4.62) | 72.5 | 57.5 | 52.5 | 47.5 | 42.5 | 37.5 | 27.5 | 47.5 | 62.5 | 82.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (4.13) | 75.5 | 59.5 | 53.5 | 39.5 | 31.5 | 25.5 | 37.5 | 59.5 | 69.5 | 82.5 |
| S.D. (1.03) | 6.7 | 4.5 | 9.6 | 10.4 | 12.4 | 7.6 | 10.6 | 18.2 | 17.2 | 0.0 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| 1933 (2.82) | 87.5 | 77.5 | 77.5 | 62.5 | 52.5 | 47.5 | 57.5 | 82.5 | 82.5 | 82.5 |
| 1961 (1.47) | 82.5 | 62.5 | 57.5 | 42.5 | 27.5 | 27.5 | 27.5 | 37.5 | 62.5 | 62.5 |
| 1975 (2.35) | 77.5 | 52.5 | 47.5 | 27.5 | 17.5 | 17.5 | 32.5 | 52.5 | 72.5 | 67.5 |
| 2016 (7.80) | 67.5 | 77.5 | 57.5 | 32.5 | 22.5 | -2.5 | 17.5 | 47.5 | 42.5 | 82.5 |
| 2076 (5.19) | 77.5 | 52.5 | 52.5 | 42.5 | 27.5 | 17.5 | 42.5 | 67.5 | 77.5 | 87.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (3.93) | 78.5 | 64.5 | 58.5 | 41.5 | 29.5 | 21.5 | 35.5 | 57.5 | 67.5 | 76.5 |
| S.D. (2.56) | 7.4 | 12.5 | 11.4 | 13.4 | 13.5 | 18.2 | 15.2 | 17.7 | 15.8 | 10.8 |

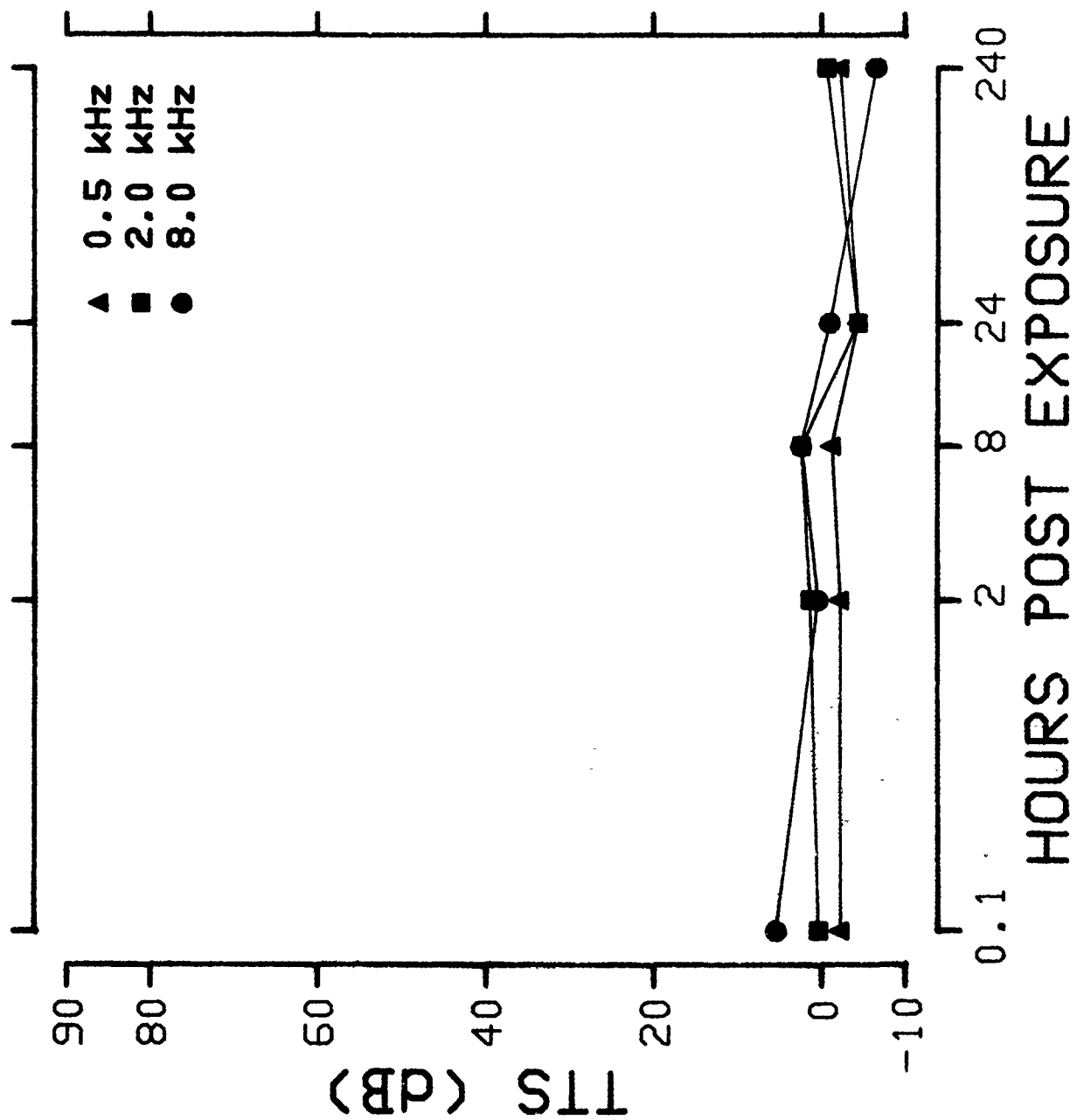
MASKED THRESHOLDS (dB SPL) Group: 155 dB 1X

Probe Frequency: 11.2 kHz

| Masker (kHz): | 1.000 | 4.000 | 7.000 | 9.000 | 11.000 | 11.500 | 12.000 | 13.000 | 14.500 | 16.000 |
|------------------|---------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1933 (2.25) | 62.5 | 47.5 | 32.5 | 22.5 | 32.5 | 42.5 | 27.5 | 27.5 | 52.5 | 77.5 |
| 1961 (6.71) | 67.5 | 52.5 | 52.5 | 57.5 | 42.5 | 37.5 | 47.5 | 47.5 | 72.5 | 72.5 |
| 1975 (****) | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 2016 (10.35) | 67.5 | 57.5 | 57.5 | 57.5 | 42.5 | 47.5 | 37.5 | 52.5 | 57.5 | 72.5 |
| 2076 (5.23) | 67.5 | 52.5 | 52.5 | 52.5 | 62.5 | 47.5 | 47.5 | 52.5 | 72.5 | 72.5 |
| Mean (6.14) | 66.3 | 52.5 | 48.8 | 47.5 | 45.0 | 43.7 | 40.0 | 45.0 | 63.8 | 73.8 |
| S.D. (3.37) | 2.5 | 4.1 | 11.1 | 16.8 | 12.6 | 4.8 | 9.6 | 11.9 | 10.3 | 2.5 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1933 (26.44) | 87.5 | 87.5 | 82.5 | 92.5 | 27.5 | 87.5 | 92.5 | 92.5 | 87.5 | 92.5 |
| 1961 (5.39) | 67.5 | 47.5 | 37.5 | 32.5 | 17.5 | 22.5 | 37.5 | 32.5 | 52.5 | 62.5 |
| 1975 (1.49) | 52.5 | 37.5 | 27.5 | 22.5 | 22.5 | 37.5 | 22.5 | 32.5 | 42.5 | 67.5 |
| 2016 (****) | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 2076 (11.48) | 62.5 | 42.5 | 42.5 | 57.5 | 32.5 | 22.5 | 32.5 | 42.5 | 62.5 | 72.5 |
| Mean (11.20) | 67.5 | 53.8 | 47.5 | 51.3 | 25.0 | 42.5 | 46.3 | 50.0 | 61.3 | 73.8 |
| S.D. (10.96) | 14.7 | 22.9 | 24.2 | 31.2 | 6.5 | 30.8 | 31.5 | 28.7 | 19.3 | 13.1 |

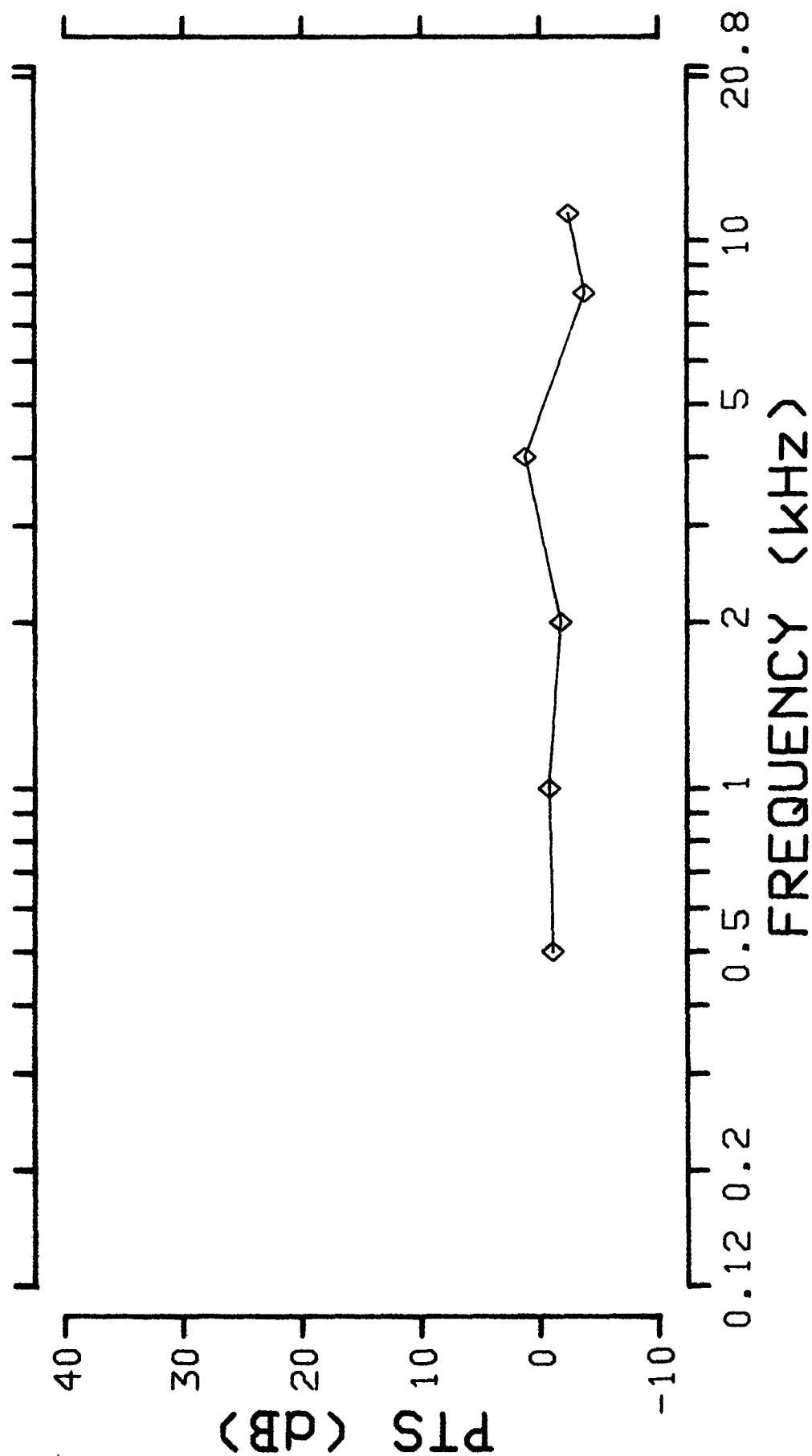
**The Group Mean Recovery Curves
Measured at Three Test Frequencies**

MEAN DATA (n=5) - 155 dB 1X



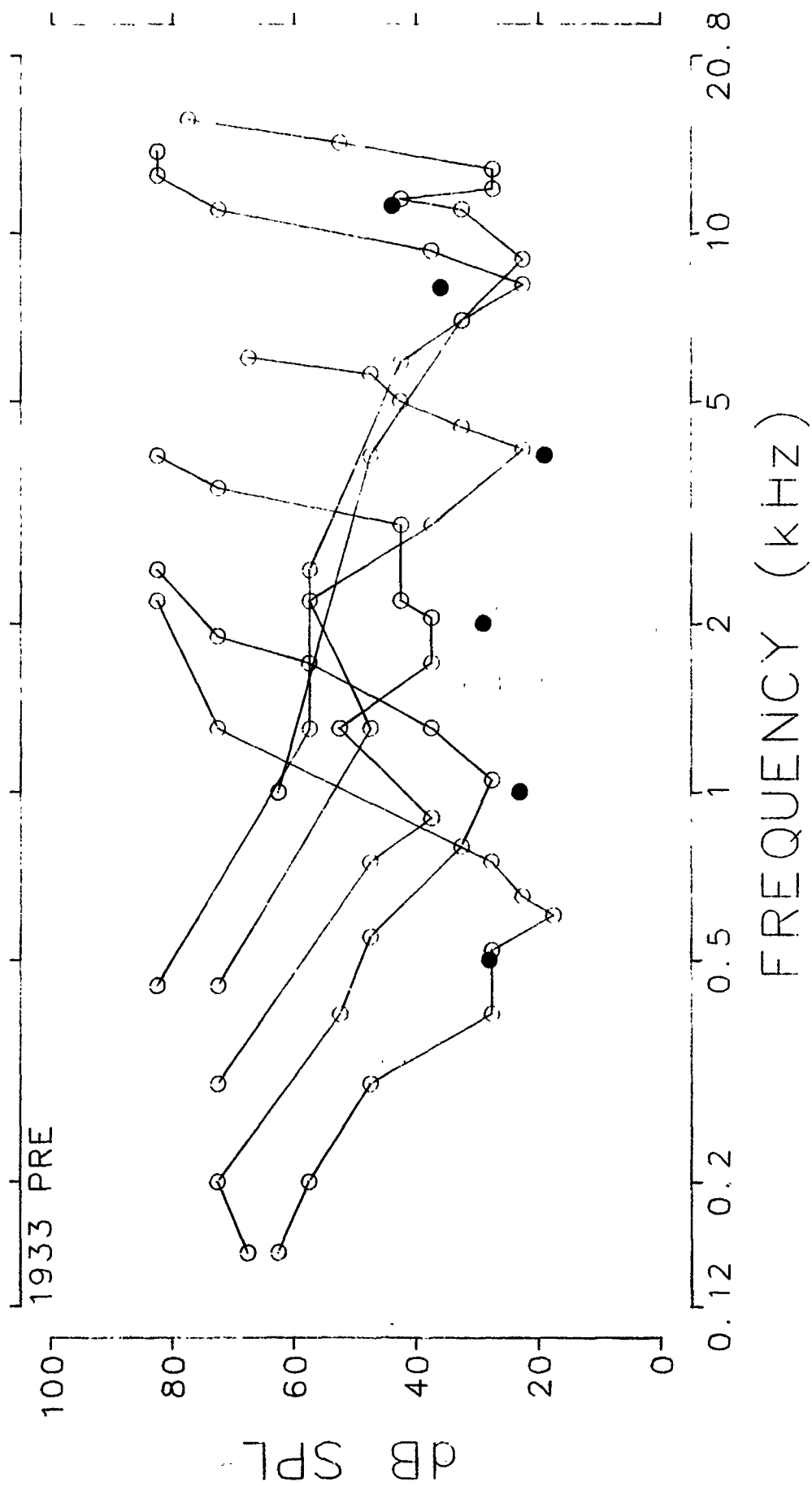
The Group Mean Permanent Threshold Shift (PTS)
for all Test Frequencies

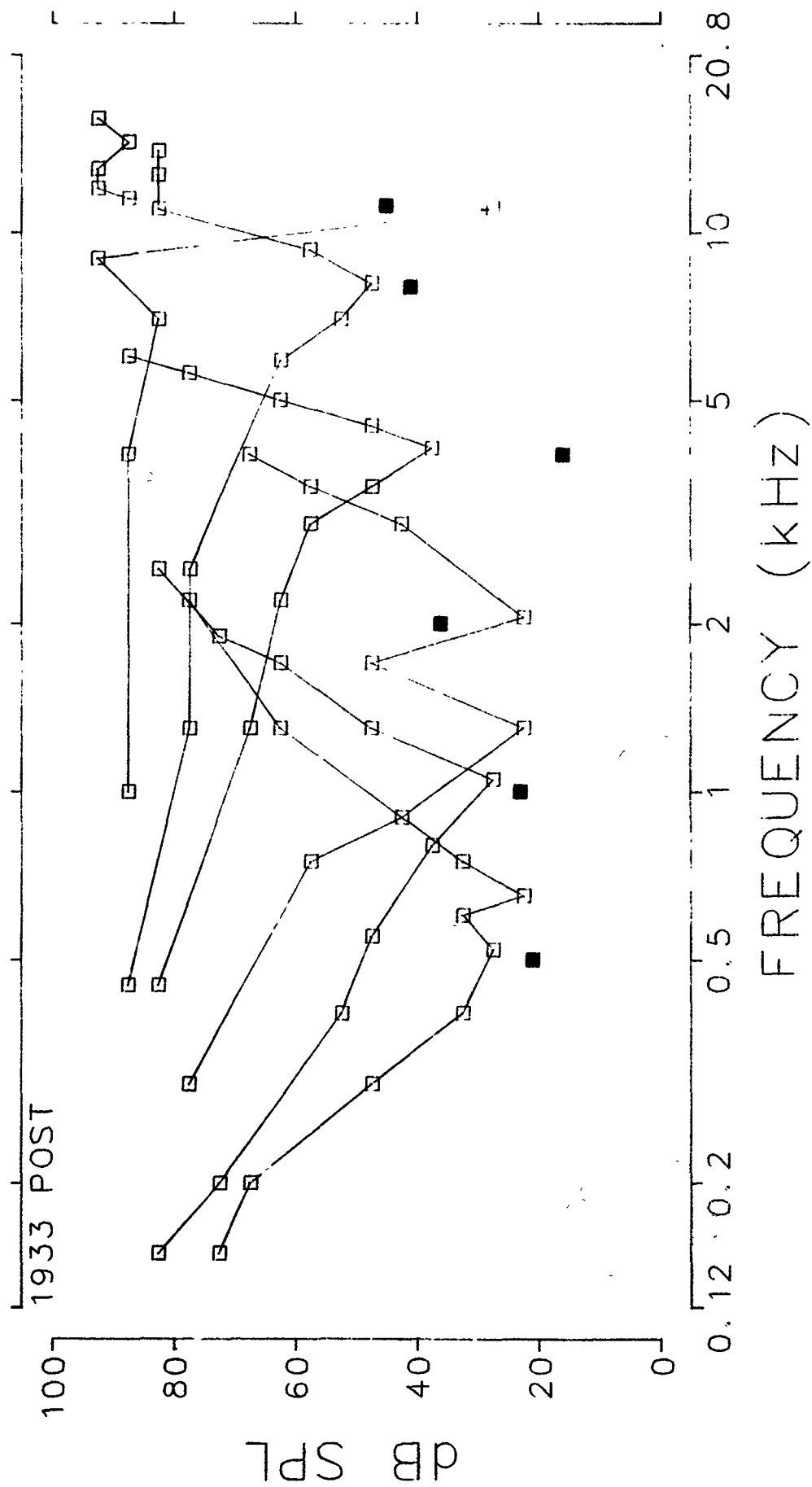
MEAN DATA (n=5) - 155 dB 1X

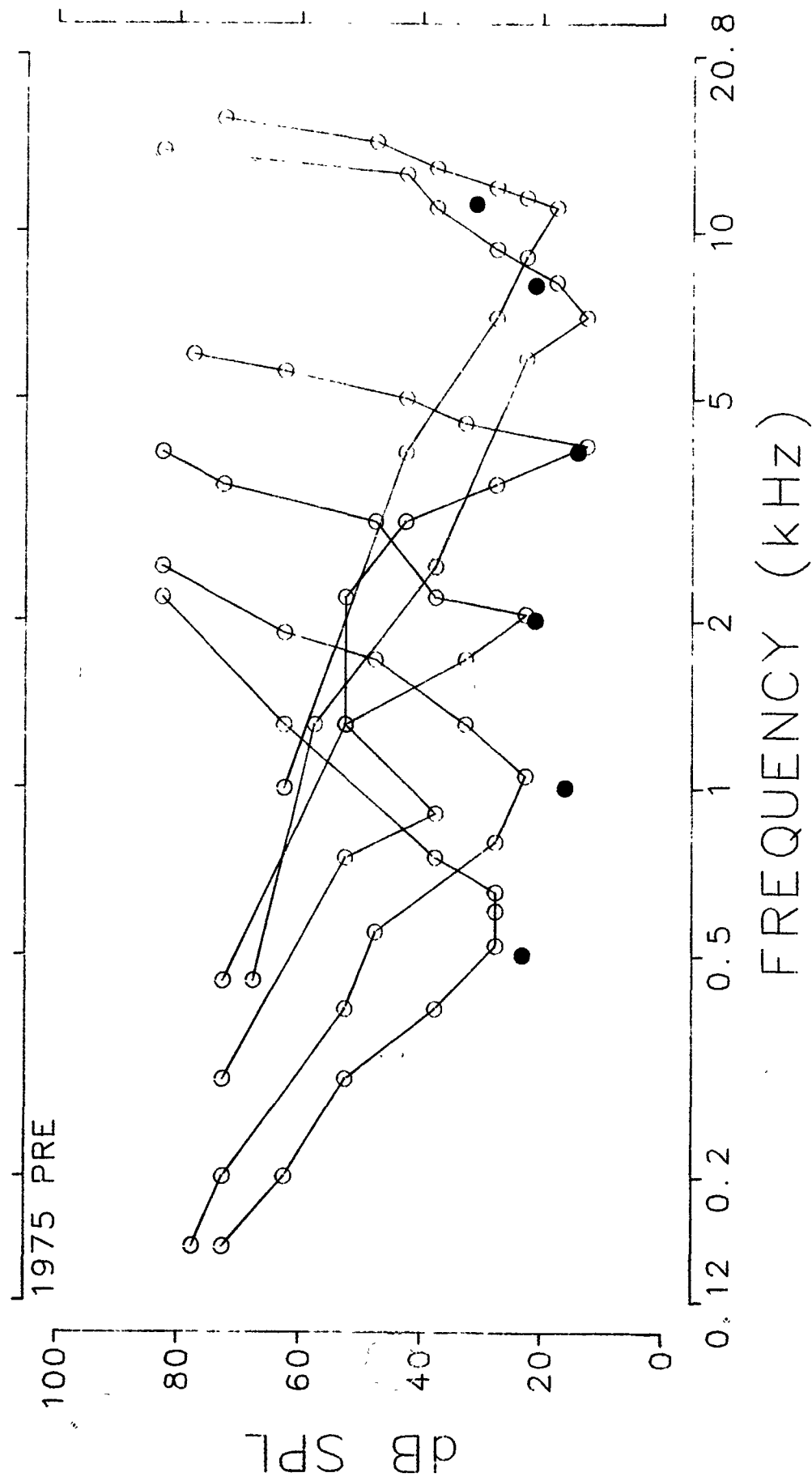


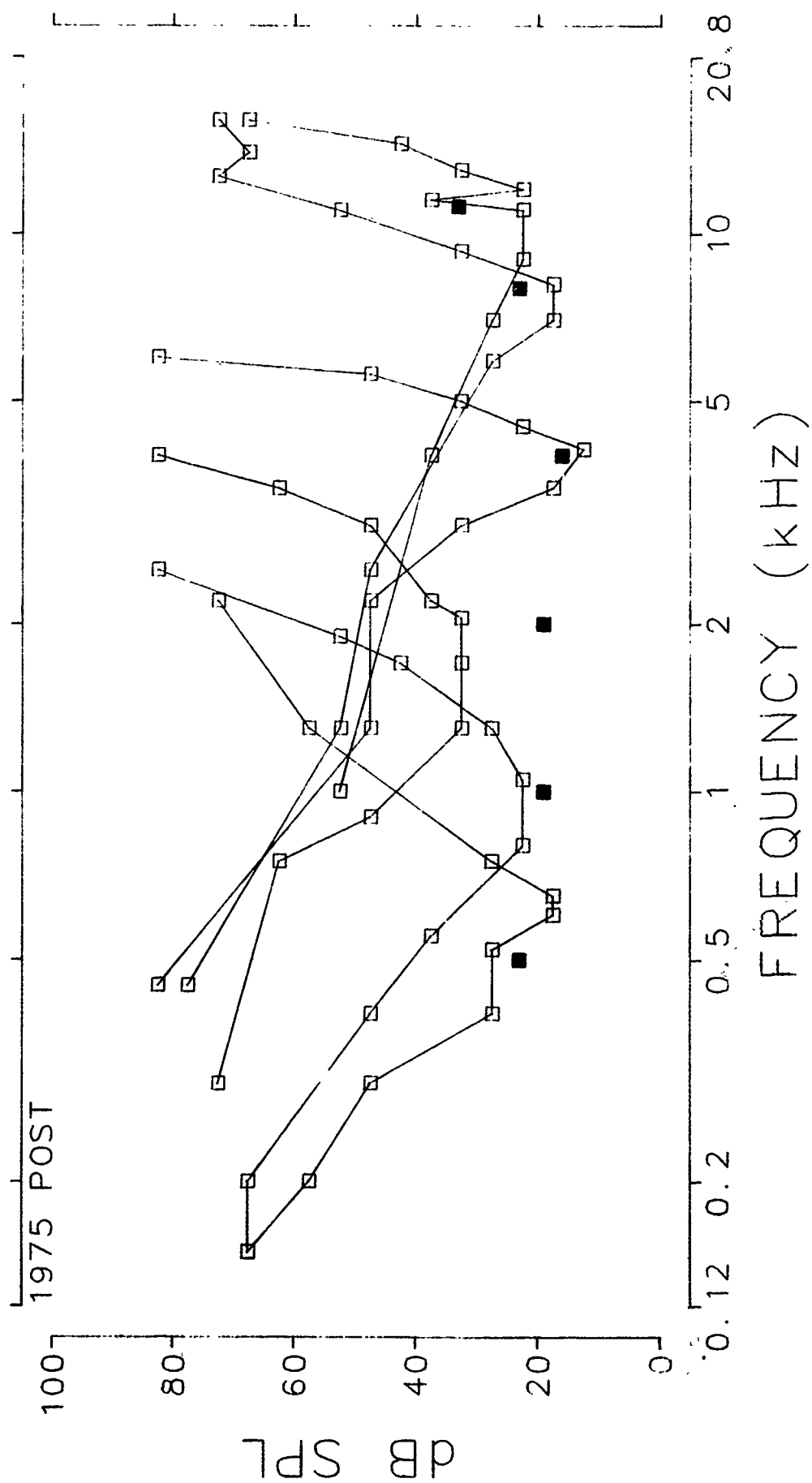
The Pre and Postexposure Tuning Curves for
Individual Animals in this Exposure Group.

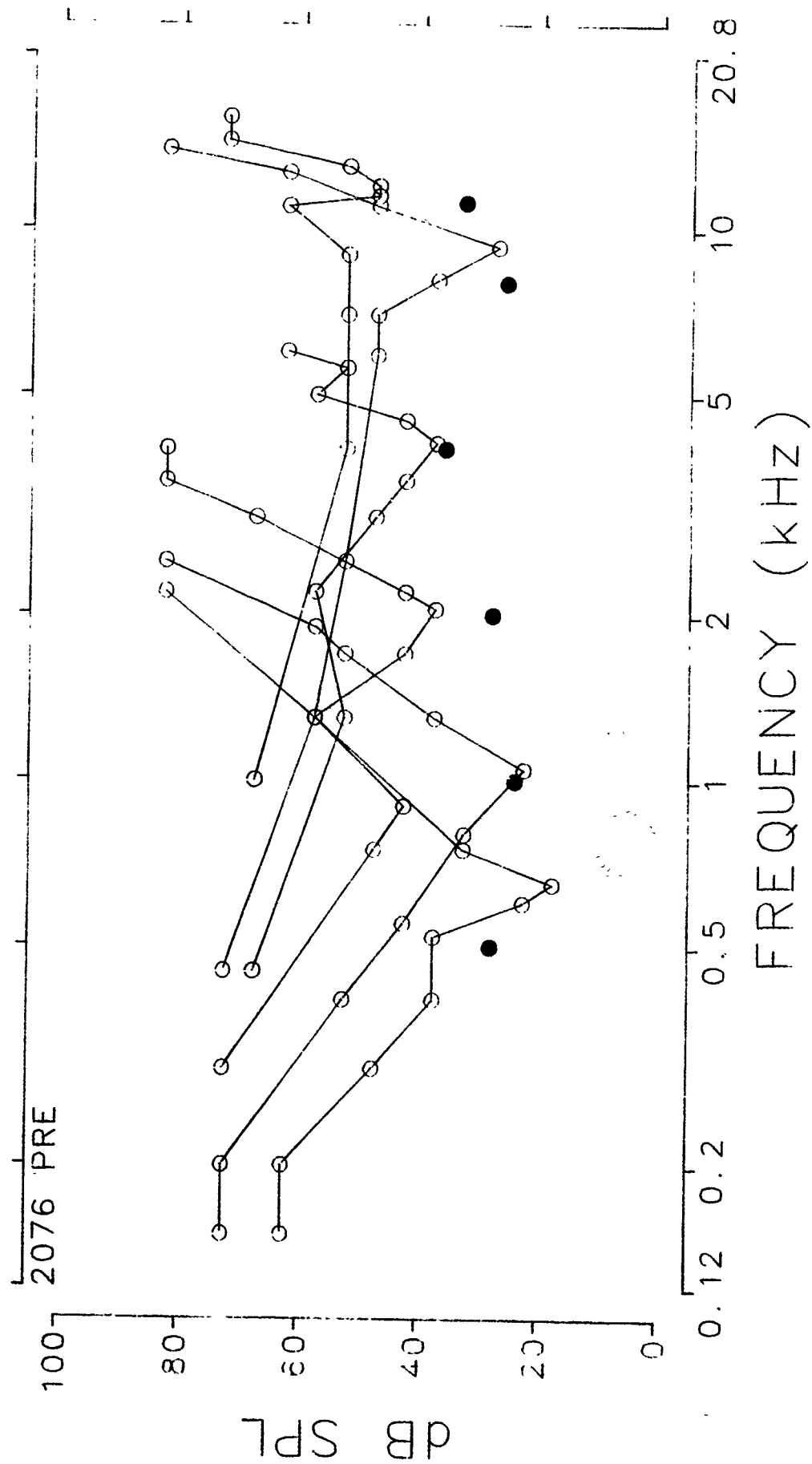
The solid symbol represents the threshold of the probe tone.

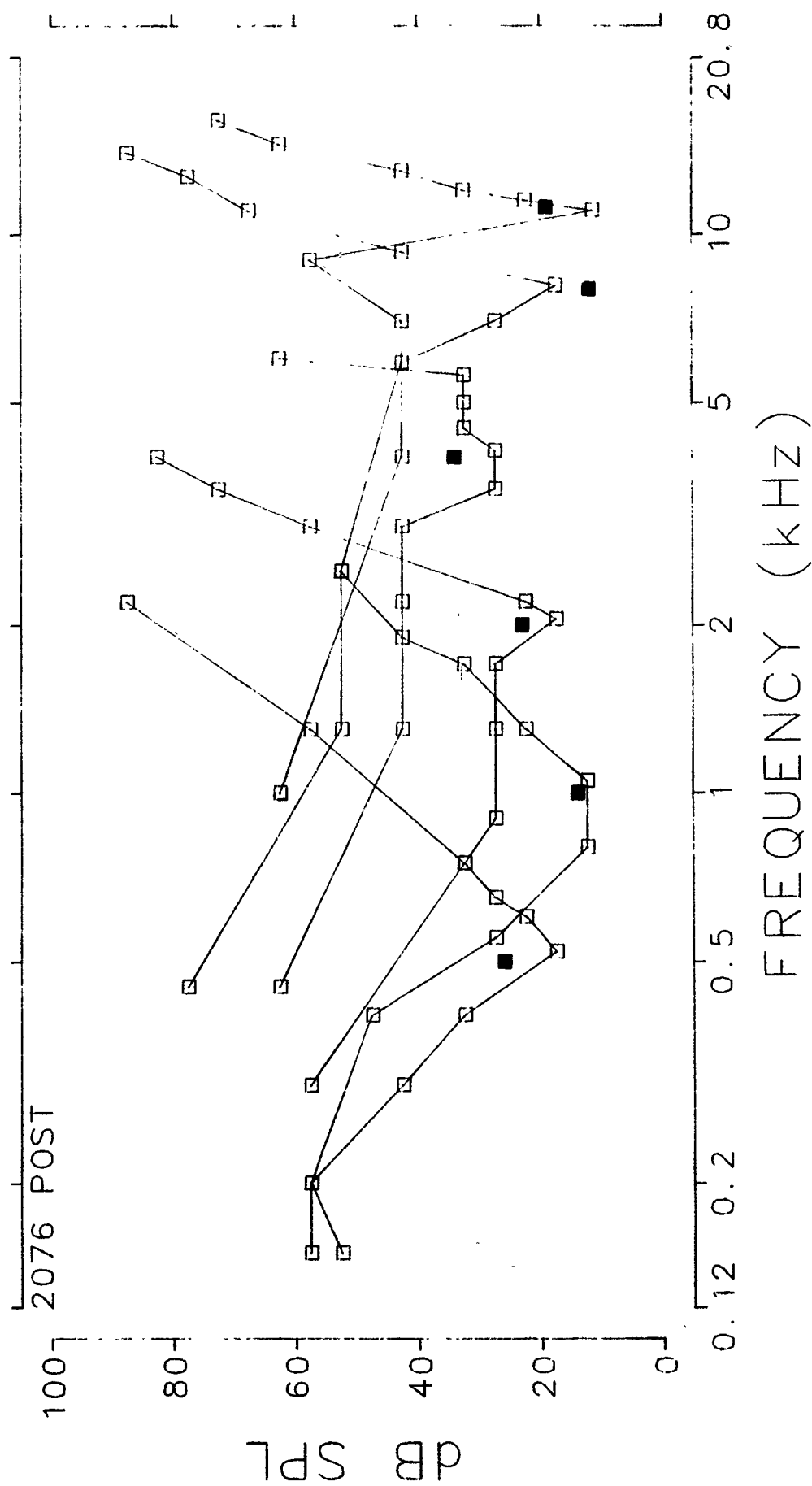


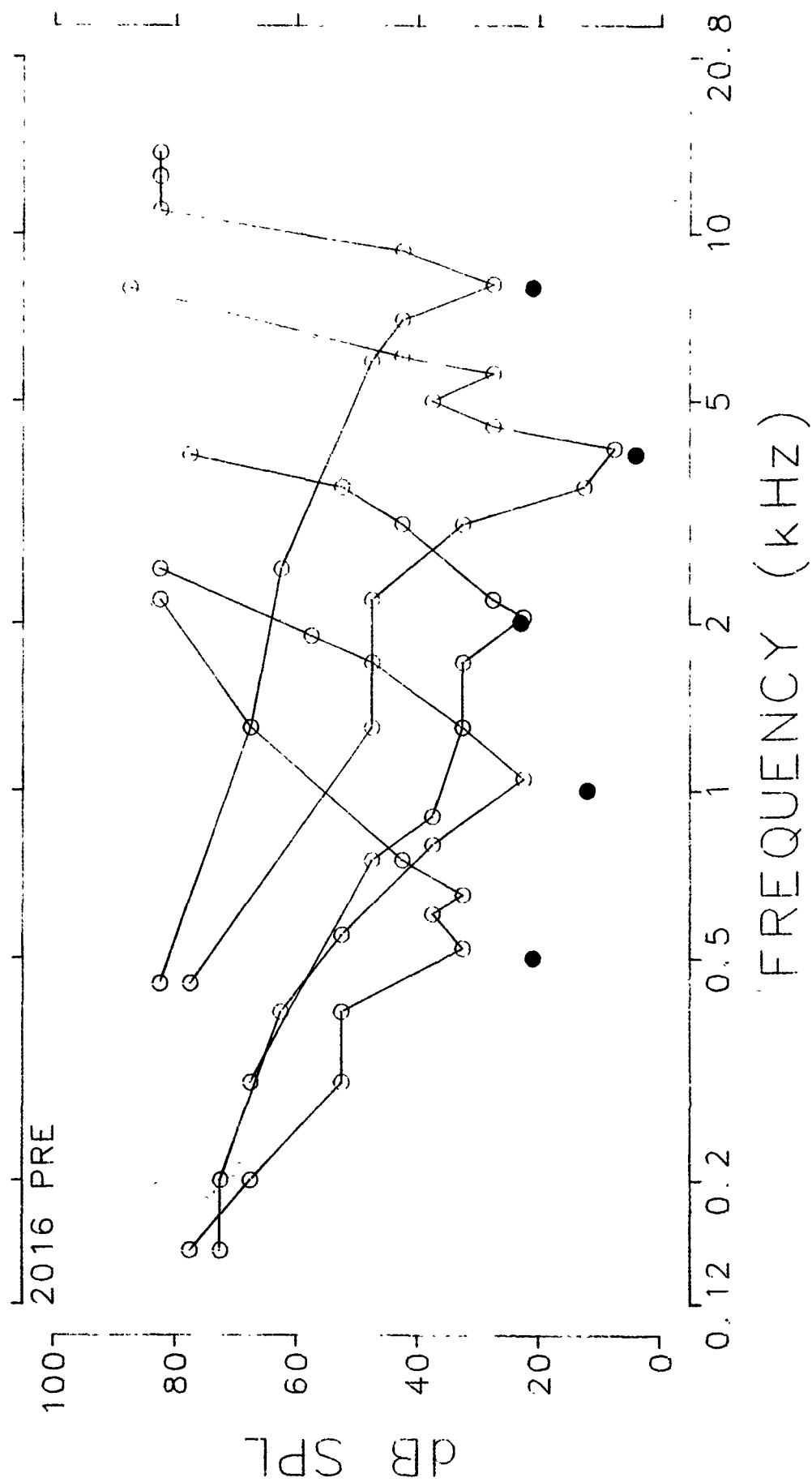


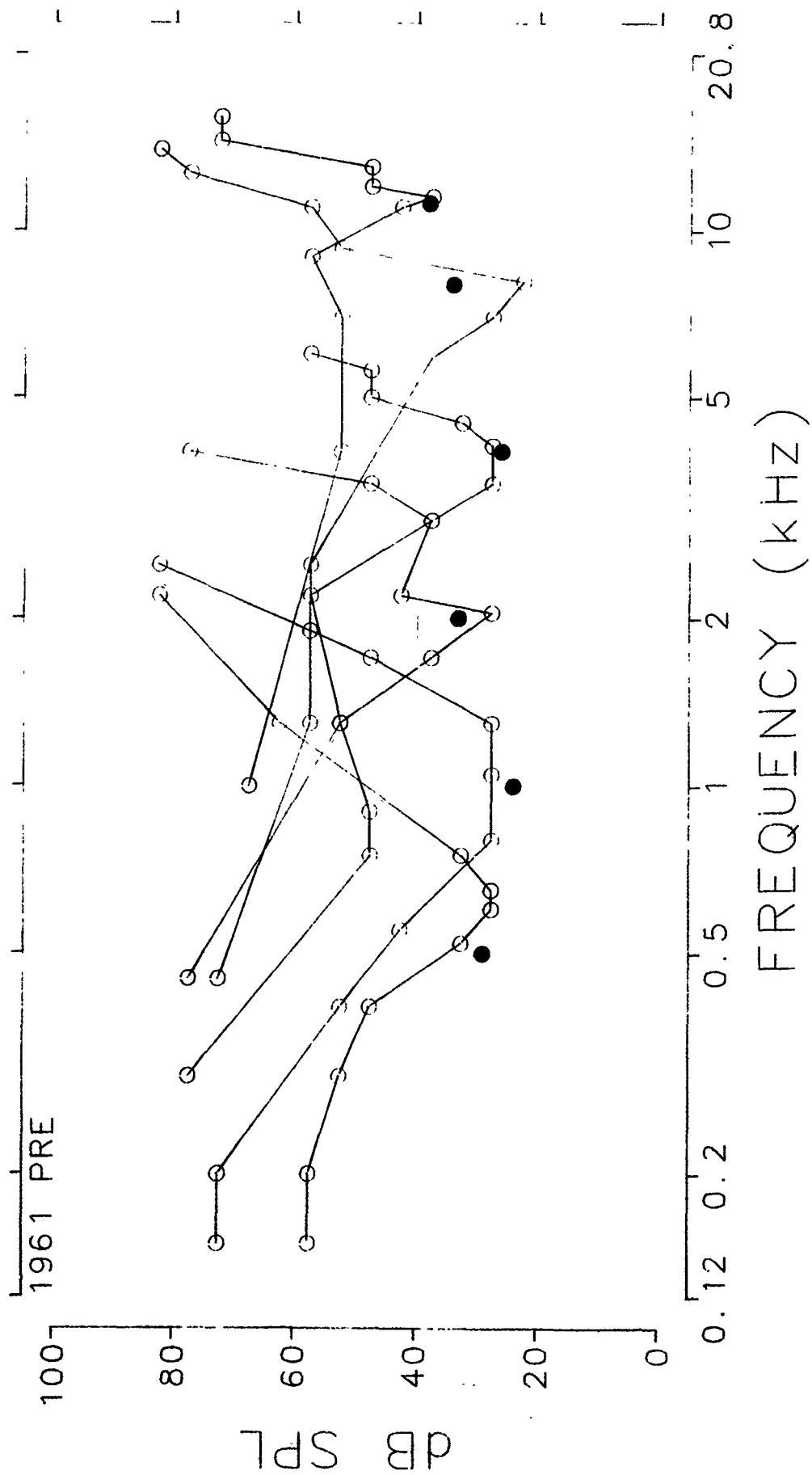


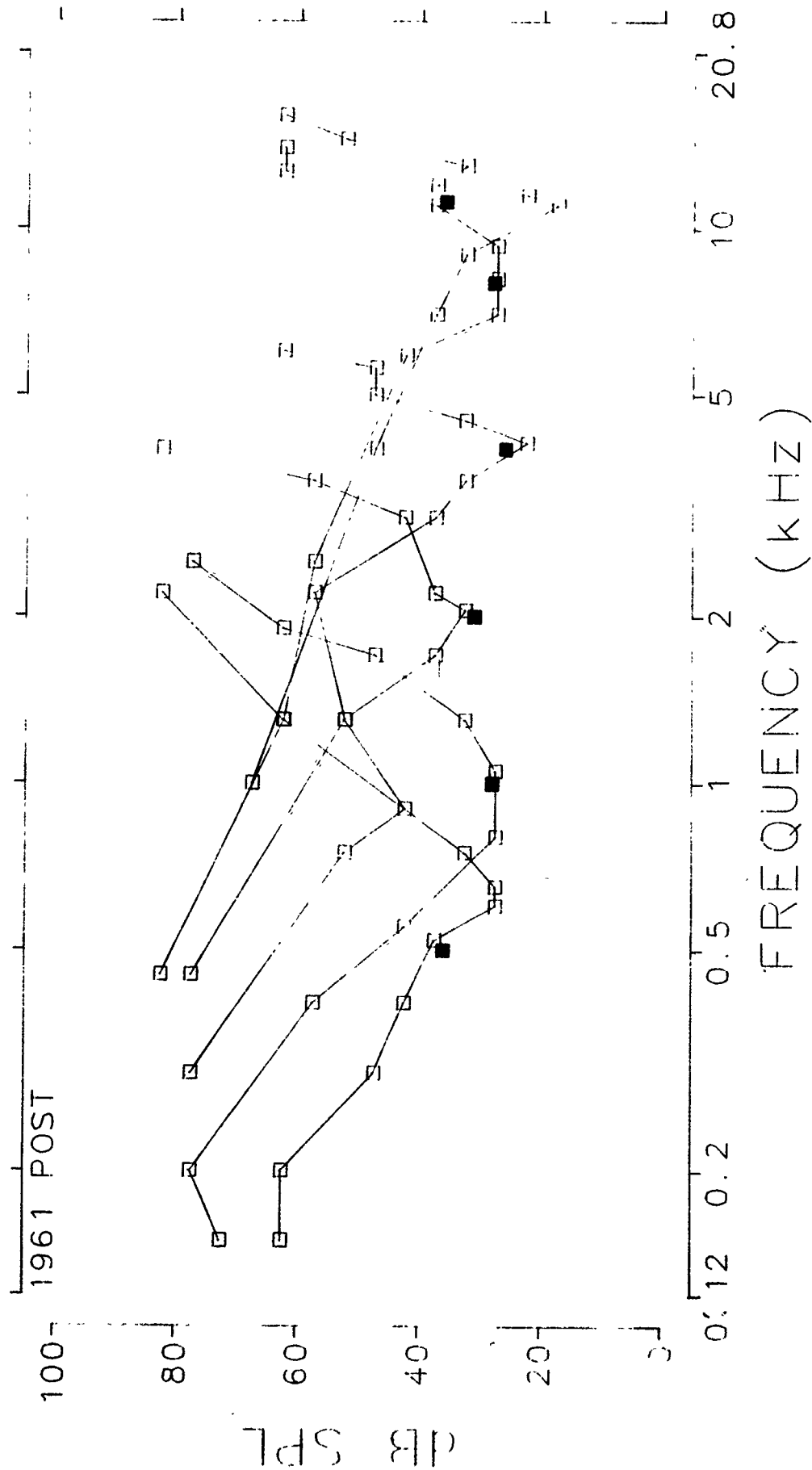


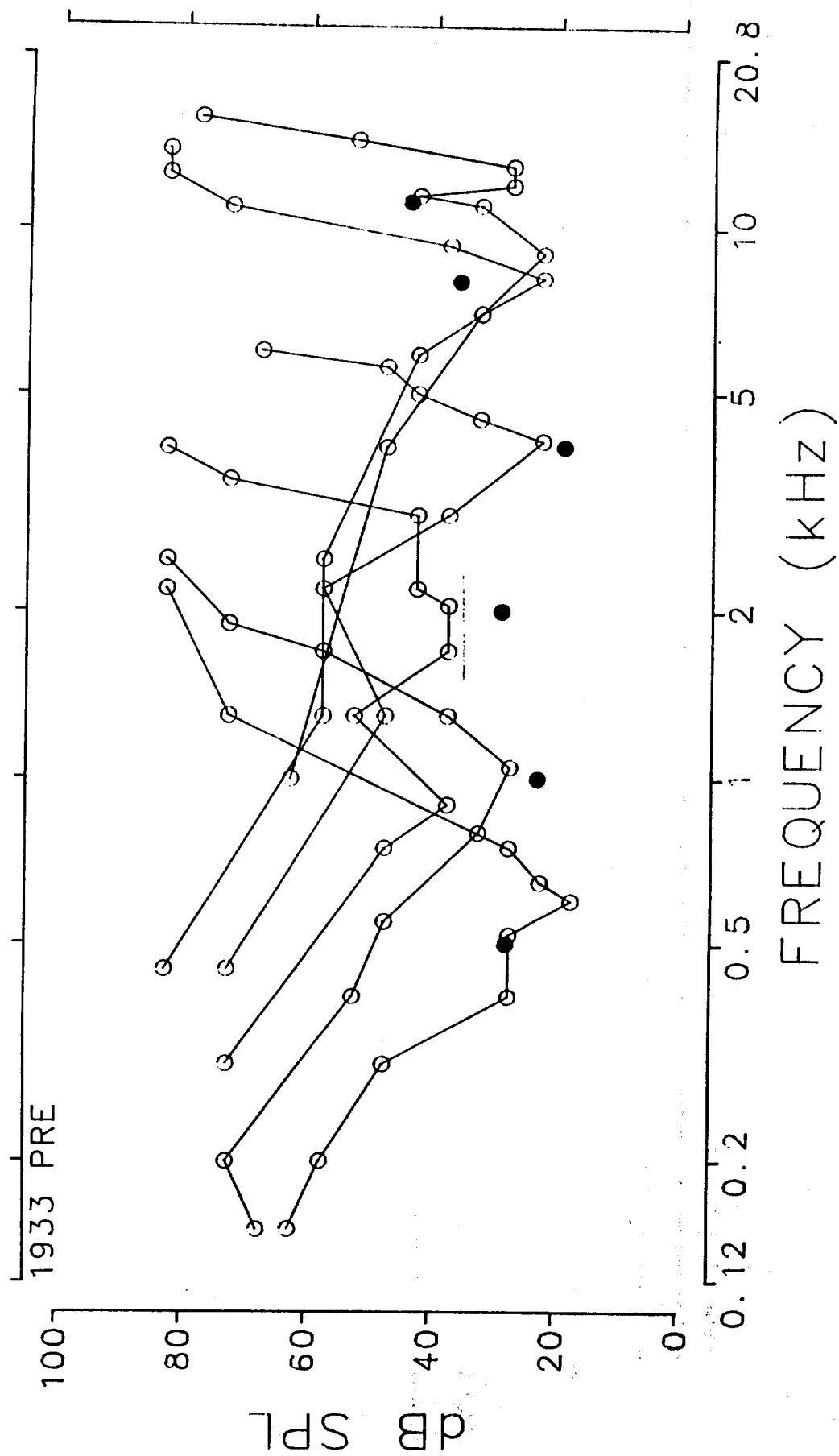


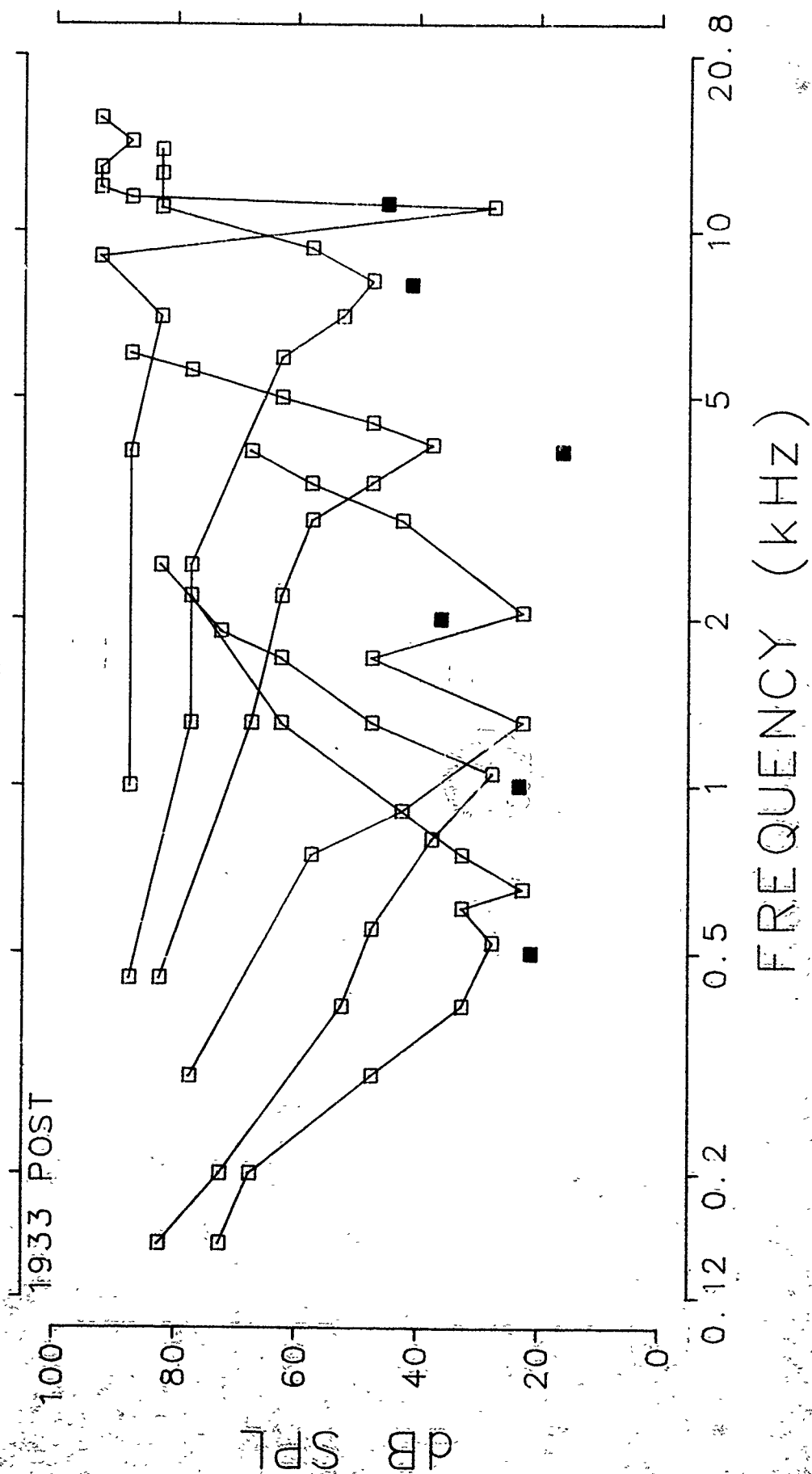












SHOCK TUBE EXPOSURE
155 dB, 1X

TOTAL NUMBER OF COCHLEAR SENSORY CELLS MISSING

| ANIMAL NUMBER | INNER HAIR CELLS | 1ST ROW OUTER HAIR CELLS | 2ND ROW OUTER HAIR CELLS | 3RD ROW OUTER HAIR CELLS | TOTAL OUTER HAIR CELLS |
|------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------------------------|
| R1396R | 3 | 35 | 42 | 97 | 174 |
| R1337R | 99 | 317 | 284 | 482 | 1083 |
| R1933R | 7 | 29 | 28 | 59 | 116 |
| R1961R | 12 | 67 | 159 | 123 | 349 |
| R1975R | 4 | 62 | 78 | 61 | 201 |
| R2016R | 21 | 20 | 39 | 56 | 115 |
| R2076R | 31 | 116 | 49 | 76 | 241 |
| GROUP MEAN | 25 | | | | 326 |
| S.D. | 34 | | | | 344 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND LENGTHS OF THE
COCHLEA CENTERED AT THE FREQUENCIES INDICATED

| GROUP MEANS | OCTAVE BAND CENTER FREQUENCY | INNER HAIR CELLS | OUTER HAIR CELLS |
|-------------|------------------------------------|------------------------|------------------------|
| | 0.125 kHz | 2.1 | 62.0 |
| | 0.25 kHz | 4.7 | 58.7 |
| | 0.5 kHz | 3.3 | 52.7 |
| | 1 kHz | 3.1 | 53.3 |
| | 2 kHz | 1.7 | 20.7 |
| | 4 kHz | 5.3 | 33.6 |
| | 8 kHz | 2.9 | 26.3 |
| | 16 kHz | 2.0 | 16.1 |

STANDARD DEVIATIONS

| | | |
|-----------|-----|------|
| 0.125 kHz | 1.1 | 51.9 |
| 0.25 kHz | 4.3 | 77.3 |
| 0.5 kHz | 5.3 | 57.7 |
| 1 kHz | 5.0 | 65.7 |
| 2 kHz | 2.8 | 17.1 |
| 4 kHz | 9.4 | 39.5 |
| 8 kHz | 5.0 | 48.2 |
| 16 kHz | 4.4 | 19.3 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLA CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|-------------------------|
| CHINCHILLA R1396R | | | | | | | |
| 0.125 kHz | 1 | 1 | 11 | 21 | 33 | 0 | 7 |
| 0.25 kHz | 1 | 14 | 10 | 45 | 69 | 0 | 1 |
| 0.5 kHz | 0 | 10 | 15 | 21 | 46 | 0 | 1 |
| 1 kHz | 0 | 3 | 5 | 7 | 15 | 0 | 0 |
| 2 kHz | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 4 kHz | 0 | 4 | 1 | 2 | 7 | 0 | 0 |
| 8 kHz | 0 | 2 | 0 | 1 | 3 | 0 | 0 |
| 16 kHz | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTALS | 3 | 35 | 42 | 97 | 174 | 0 | 9 |

CHINCHILLA R1337R

| | | | | | | | |
|-----------|----|-----|-----|-----|------|---|----|
| 0.125 kHz | 1 | 56 | 38 | 76 | 170 | 1 | 5 |
| 0.25 kHz | 11 | 60 | 43 | 124 | 227 | 0 | 6 |
| 0.5 kHz | 15 | 40 | 50 | 86 | 176 | 1 | 6 |
| 1 kHz | 13 | 50 | 60 | 60 | 170 | 1 | 7 |
| 2 kHz | 8 | 16 | 12 | 19 | 47 | 0 | 3 |
| 4 kHz | 24 | 34 | 23 | 39 | 96 | 4 | 9 |
| 8 kHz | 14 | 38 | 35 | 61 | 134 | 0 | 7 |
| 16 kHz | 12 | 19 | 21 | 16 | 56 | 0 | 0 |
| TOTALS | 99 | 317 | 284 | 482 | 1083 | 7 | 43 |

CHINCHILLA R1933R

| | | | | | | | |
|-----------|---|----|----|----|-----|---|---|
| 0.125 kHz | 4 | 2 | 14 | 21 | 37 | 0 | 1 |
| 0.25 kHz | 2 | 0 | 0 | 8 | 8 | 0 | 0 |
| 0.5 kHz | 1 | 3 | 6 | 15 | 24 | 0 | 1 |
| 1 kHz | 0 | 3 | 4 | 8 | 15 | 0 | 0 |
| 2 kHz | 0 | 5 | 1 | 2 | 8 | 0 | 0 |
| 4 kHz | 0 | 13 | 2 | 1 | 16 | 0 | 1 |
| 8 kHz | 0 | 3 | 0 | 1 | 4 | 0 | 0 |
| 16 kHz | 0 | 0 | 1 | 3 | 4 | 0 | 0 |
| TOTALS | 7 | 29 | 28 | 59 | 116 | 0 | 3 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1961R | | | | | | | |
| 0.125 kHz | 2 | 5 | 12 | 26 | 43 | 0 | 1 |
| 0.25 kHz | 5 | 9 | 6 | 36 | 51 | 0 | 0 |
| 0.5 kHz | 3 | 36 | 20 | 10 | 66 | 0 | 0 |
| 1 kHz | 0 | 11 | 97 | 16 | 124 | 0 | 0 |
| 2 kHz | 0 | 3 | 21 | 14 | 38 | 0 | 0 |
| 4 kHz | 1 | 1 | 0 | 20 | 21 | 0 | 0 |
| 8 kHz | 1 | 1 | 2 | 0 | 3 | 0 | 0 |
| 16 kHz | 0 | 0 | 1 | 1 | 2 | 0 | 0 |
| TOTALS | 12 | 67 | 159 | 123 | 349 | 0 | 1 |

CHINCHILLA R1975R

| | | | | | | | |
|-----------|---|----|----|----|-----|---|---|
| 0.125 kHz | 2 | 23 | 32 | 29 | 84 | 0 | 0 |
| 0.25 kHz | 0 | 4 | 3 | 10 | 17 | 0 | 0 |
| 0.5 kHz | 0 | 6 | 15 | 0 | 21 | 0 | 1 |
| 1 kHz | 1 | 8 | 15 | 3 | 26 | 0 | 0 |
| 2 kHz | 1 | 9 | 2 | 8 | 19 | 1 | 0 |
| 4 kHz | 0 | 1 | 3 | 0 | 4 | 0 | 0 |
| 8 kHz | 0 | 7 | 3 | 3 | 13 | 0 | 0 |
| 16 kHz | 0 | 4 | 3 | 8 | 15 | 0 | 0 |
| TOTALS | 4 | 62 | 78 | 61 | 201 | 1 | 1 |

CHINCHILLA R2016R

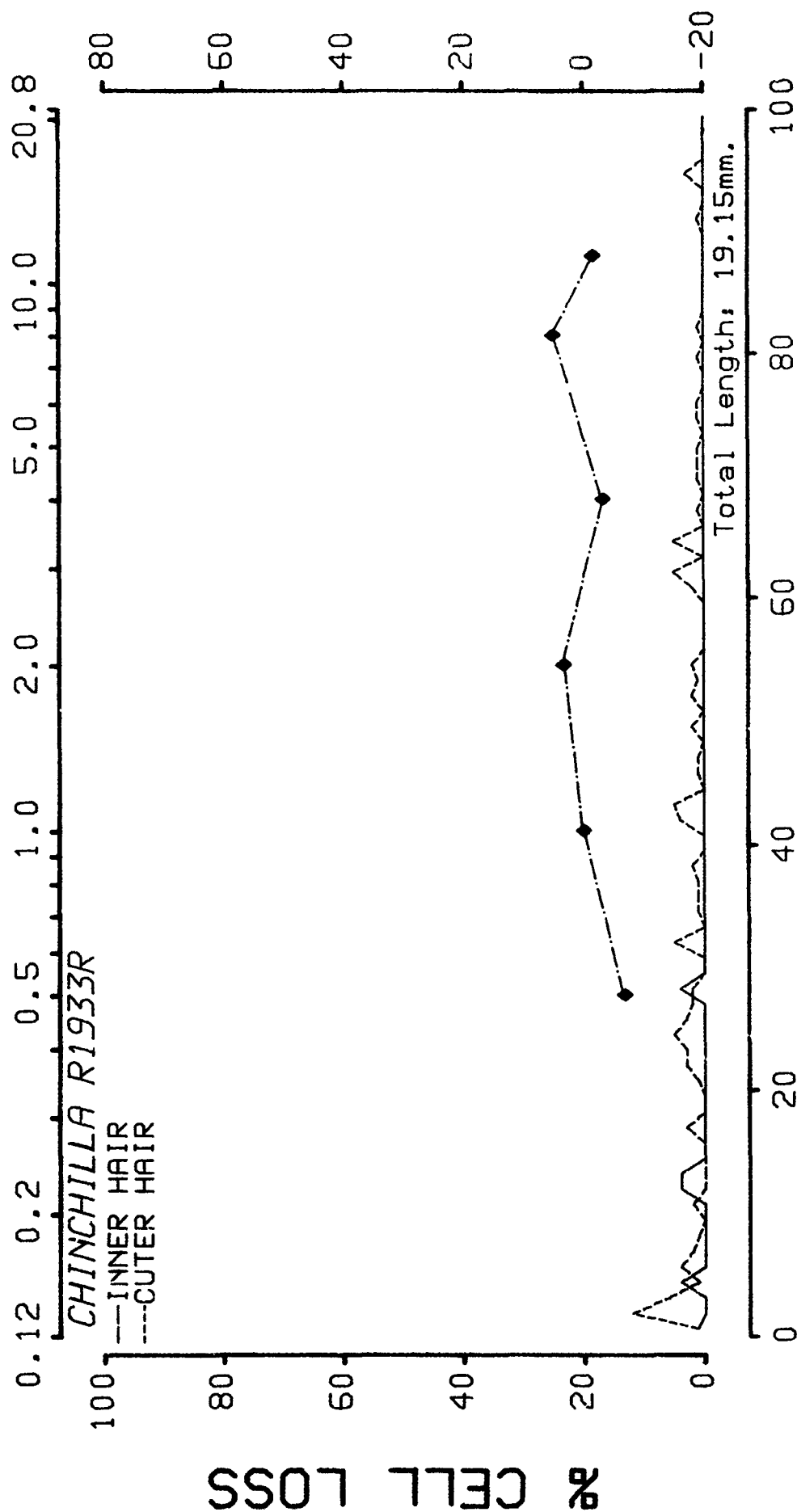
| | | | | | | | |
|-----------|----|----|----|----|-----|---|---|
| 0.125 kHz | 3 | 4 | 22 | 24 | 50 | 0 | 9 |
| 0.25 kHz | 10 | 6 | 2 | 9 | 17 | 0 | 0 |
| 0.5 kHz | 3 | 1 | 2 | 3 | 6 | 0 | 0 |
| 1 kHz | 1 | 2 | 2 | 0 | 4 | 0 | 0 |
| 2 kHz | 1 | 2 | 3 | 2 | 7 | 0 | 0 |
| 4 kHz | 0 | 1 | 3 | 2 | 6 | 0 | 0 |
| 8 kHz | 2 | 0 | 1 | 1 | 2 | 0 | 0 |
| 16 kHz | 1 | 3 | 4 | 15 | 22 | 0 | 0 |
| TOTALS | 21 | 20 | 39 | 56 | 115 | 0 | 9 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R2076R | | | | | | | |
| 0.125 kHz | 2 | 2 | 5 | 10 | 17 | 0 | 1 |
| 0.25 kHz | 4 | 5 | 4 | 13 | 22 | 0 | 1 |
| 0.5 kHz | 1 | 15 | 8 | 7 | 30 | 1 | 0 |
| 1 kHz | 7 | 10 | 4 | 5 | 19 | 4 | 0 |
| 2 kHz | 1 | 15 | 3 | 7 | 25 | 4 | 1 |
| 4 kHz | 12 | 47 | 20 | 18 | 85 | 28 | 9 |
| 8 kHz | 3 | 12 | 1 | 12 | 25 | 8 | 3 |
| 16 kHz | 1 | 7 | 3 | 4 | 14 | 1 | 1 |
| TOTALS | 31 | 116 | 49 | 76 | 241 | 46 | 16 |

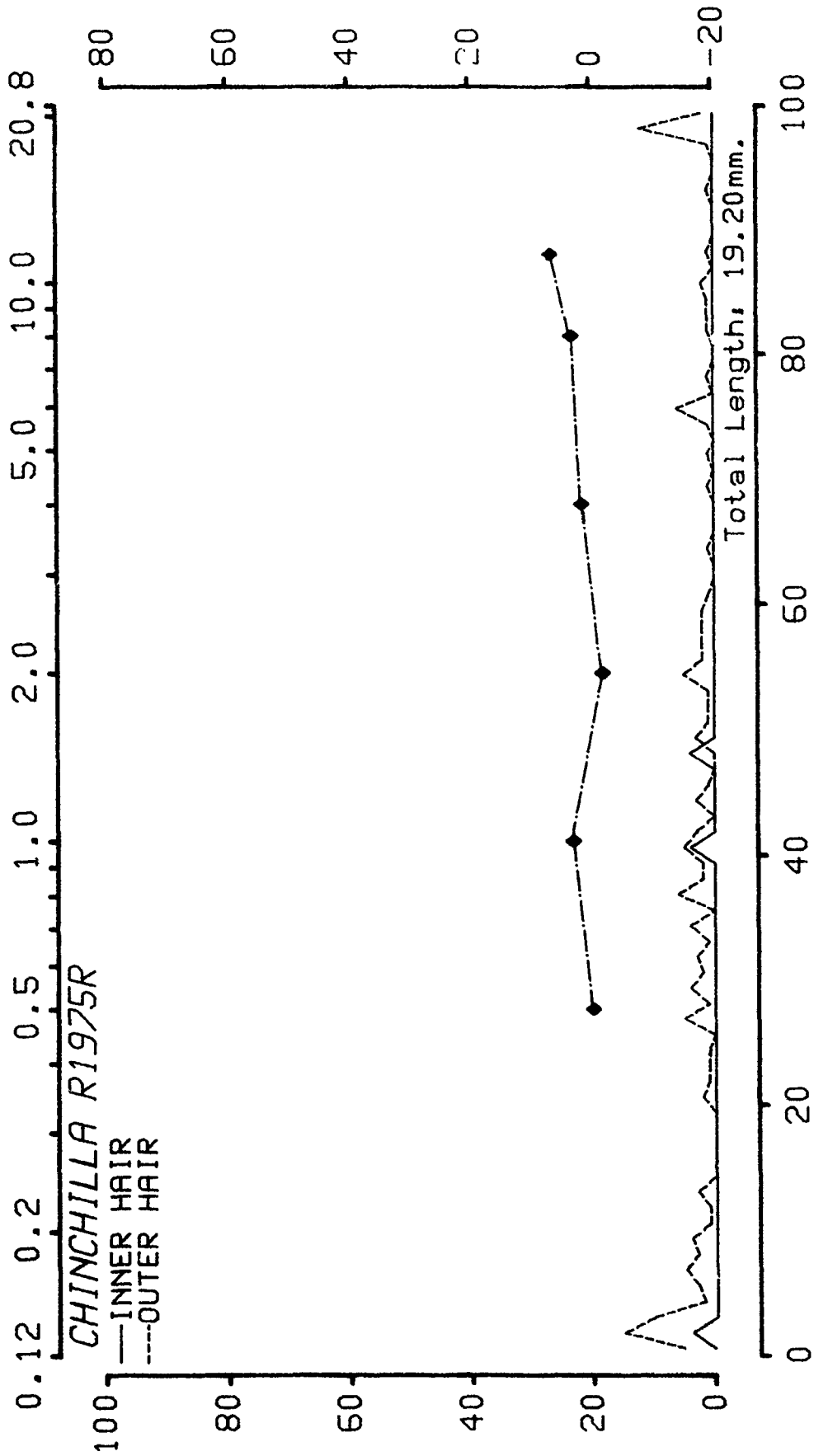
Cochleograms and PTS Audiograms
for Individual Animals

FREQUENCY (kHz)



% TOTAL DISTANCE FROM APEX

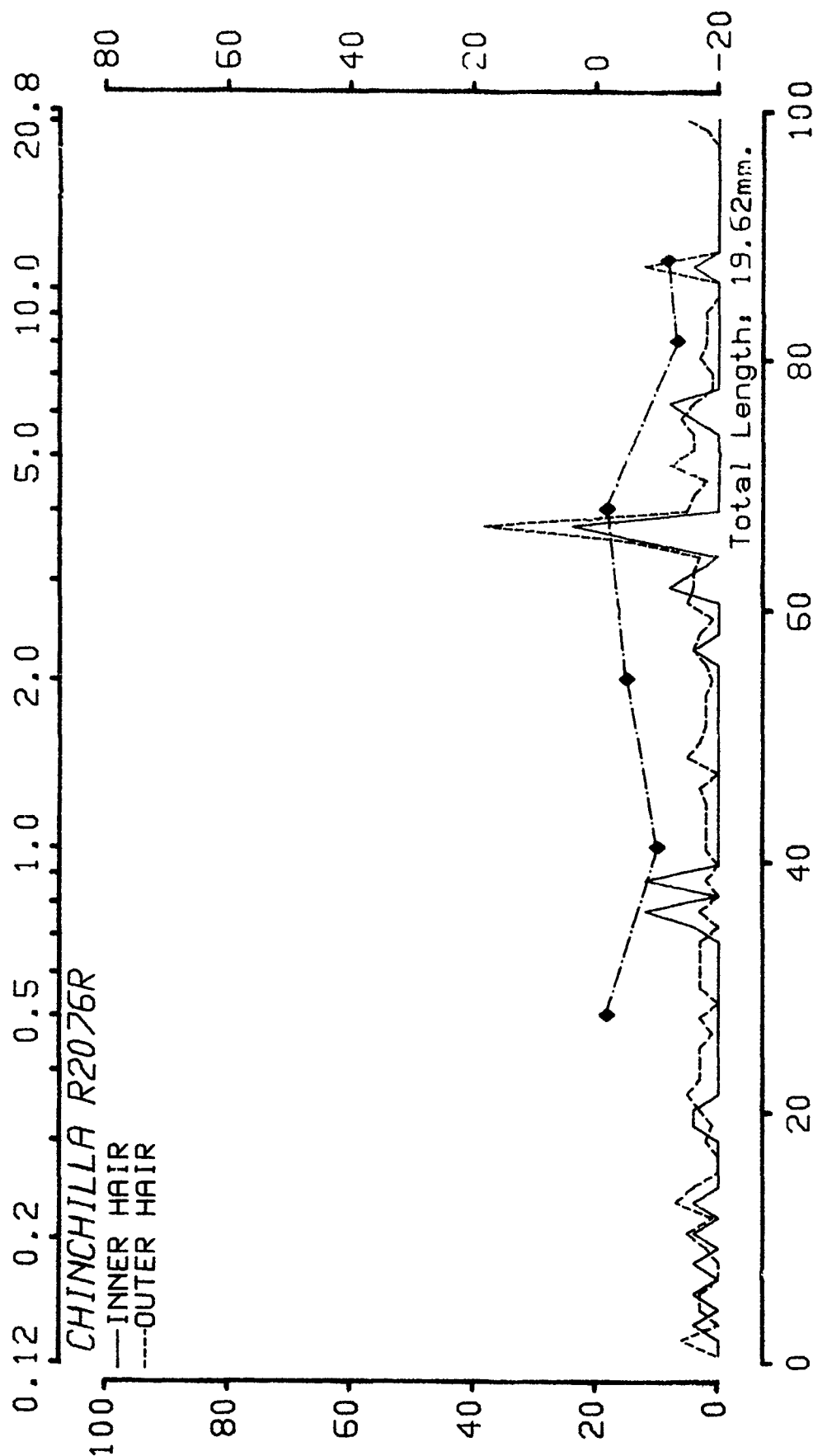
FREQUENCY (kHz)



% CELL LOSS

PTS (dB)

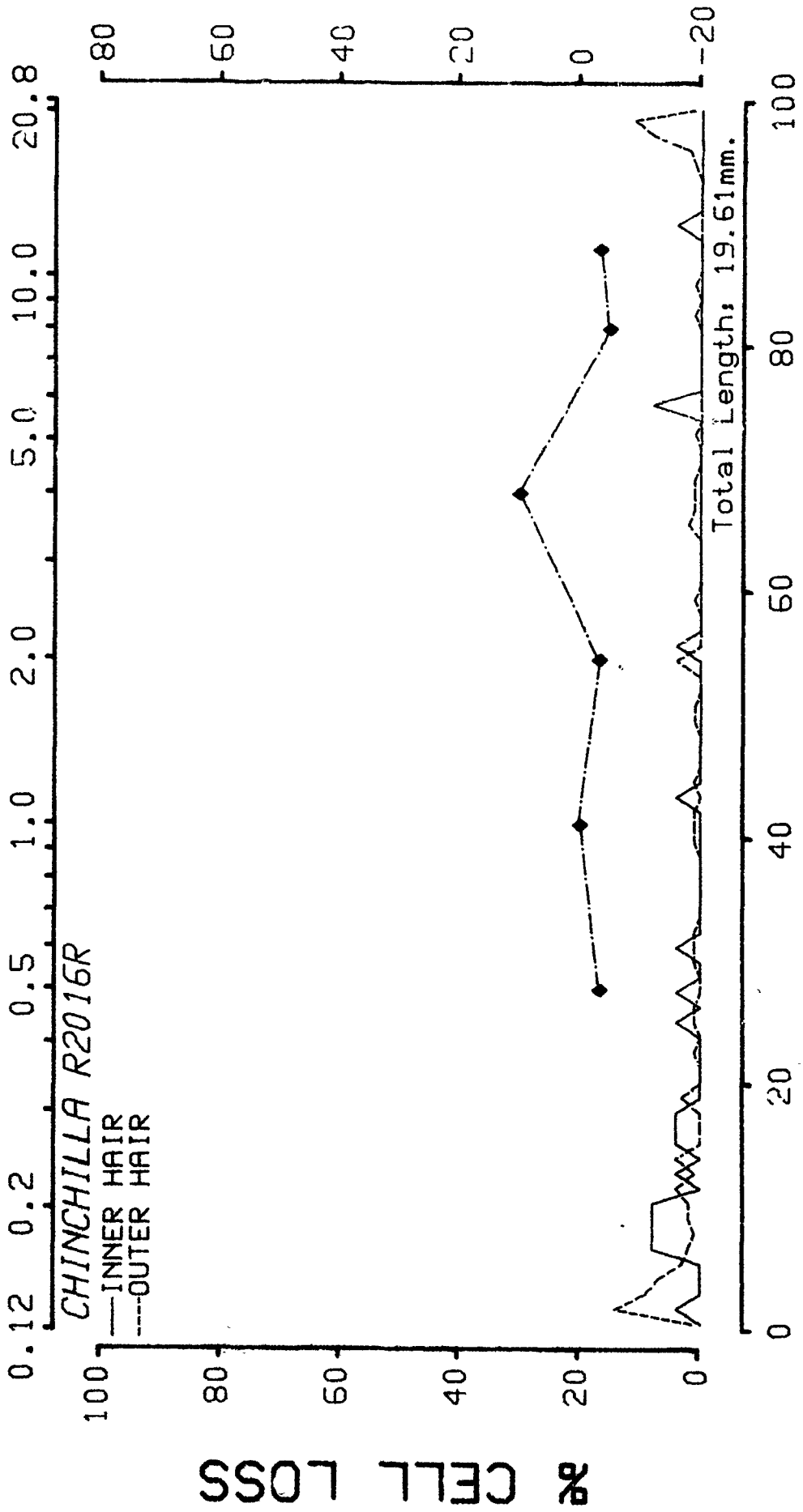
FREQUENCY (kHz)



% CELL LOSS

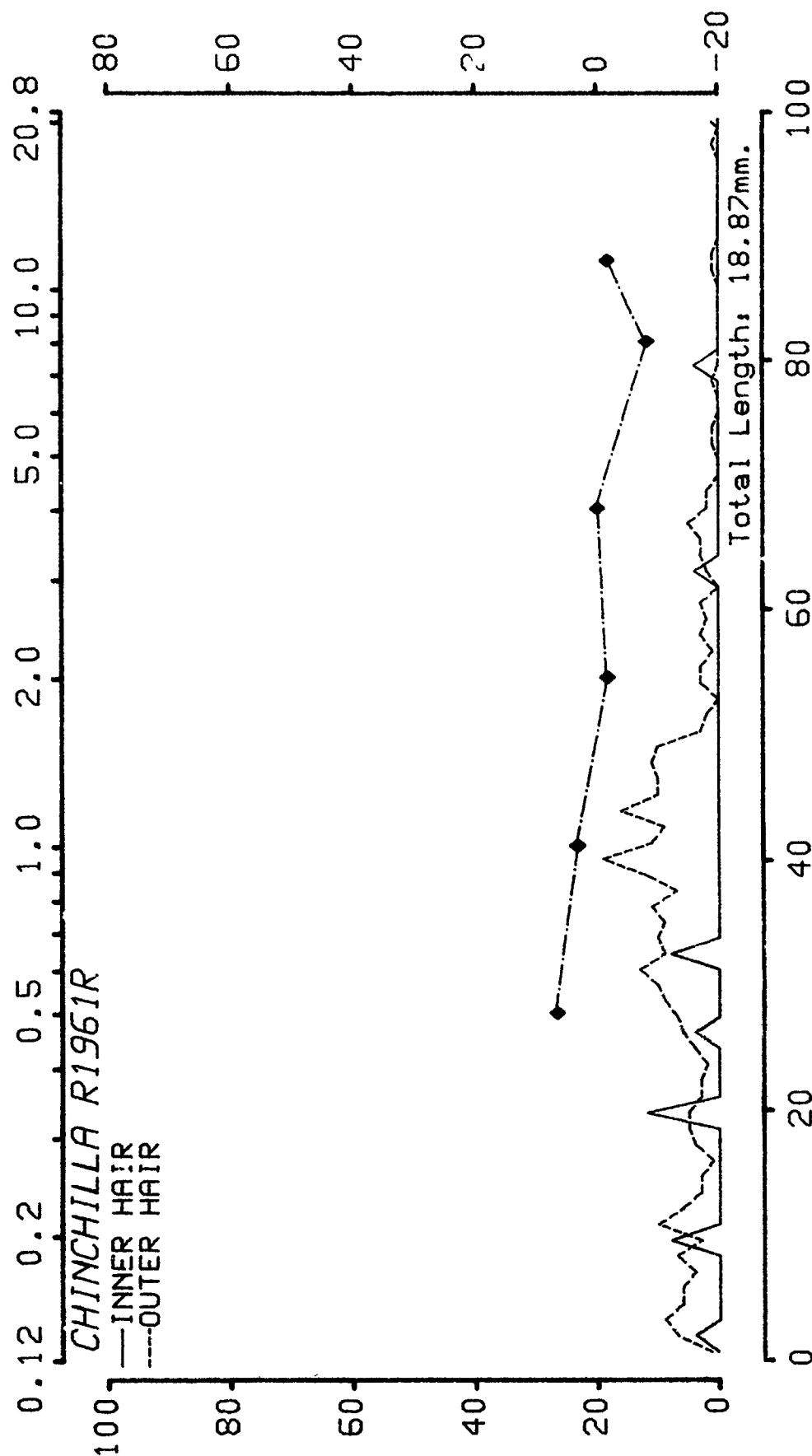
% TOTAL DISTANCE FROM APEX

FREQUENCY (KHZ)



% TOTAL DISTANCE FROM APEX

FREQUENCY (KHz)

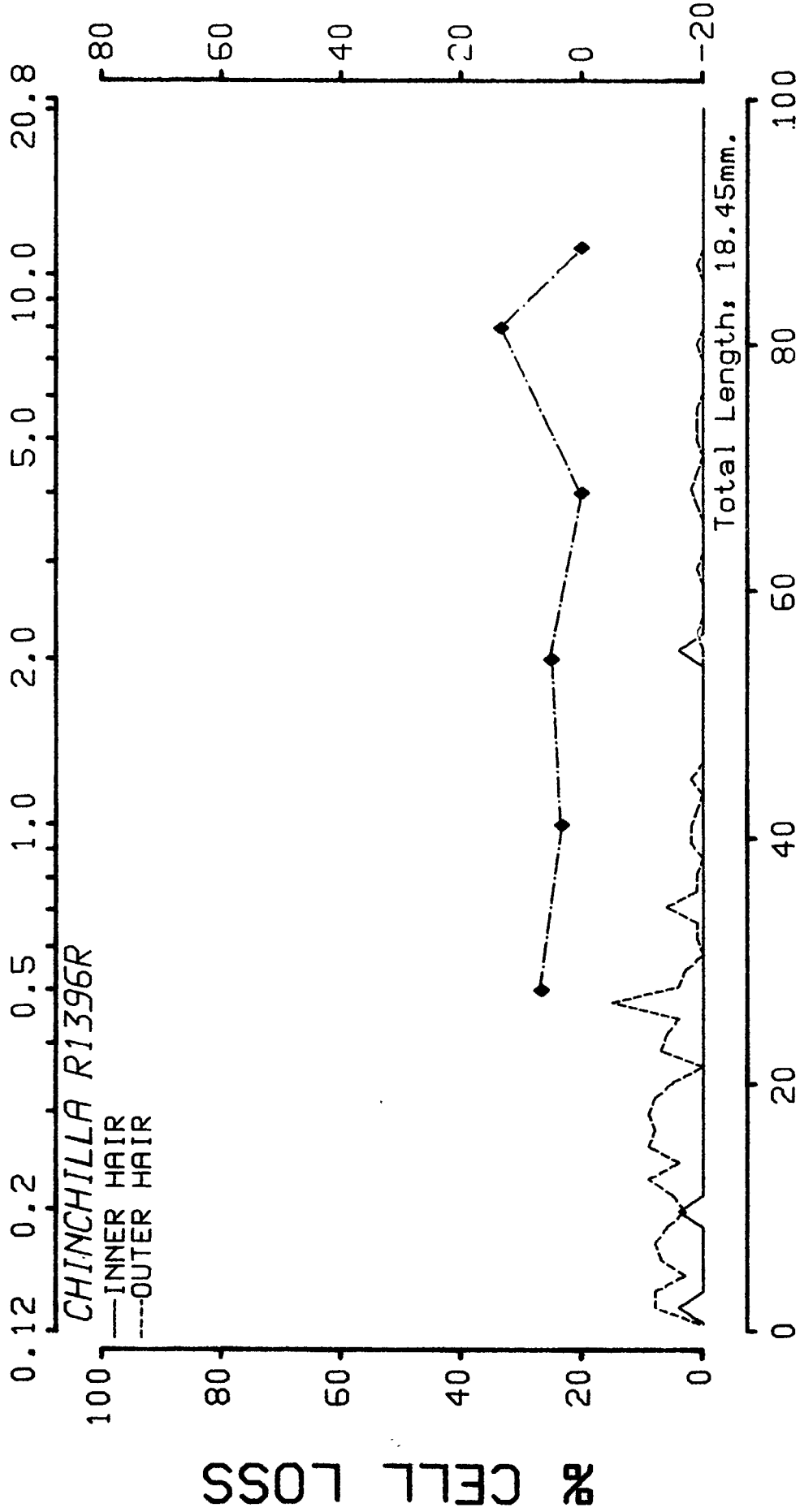


% TOTAL DISTANCE FROM APEX

% CELL LOSS

PTS (dB)

FREQUENCY (KHZ)

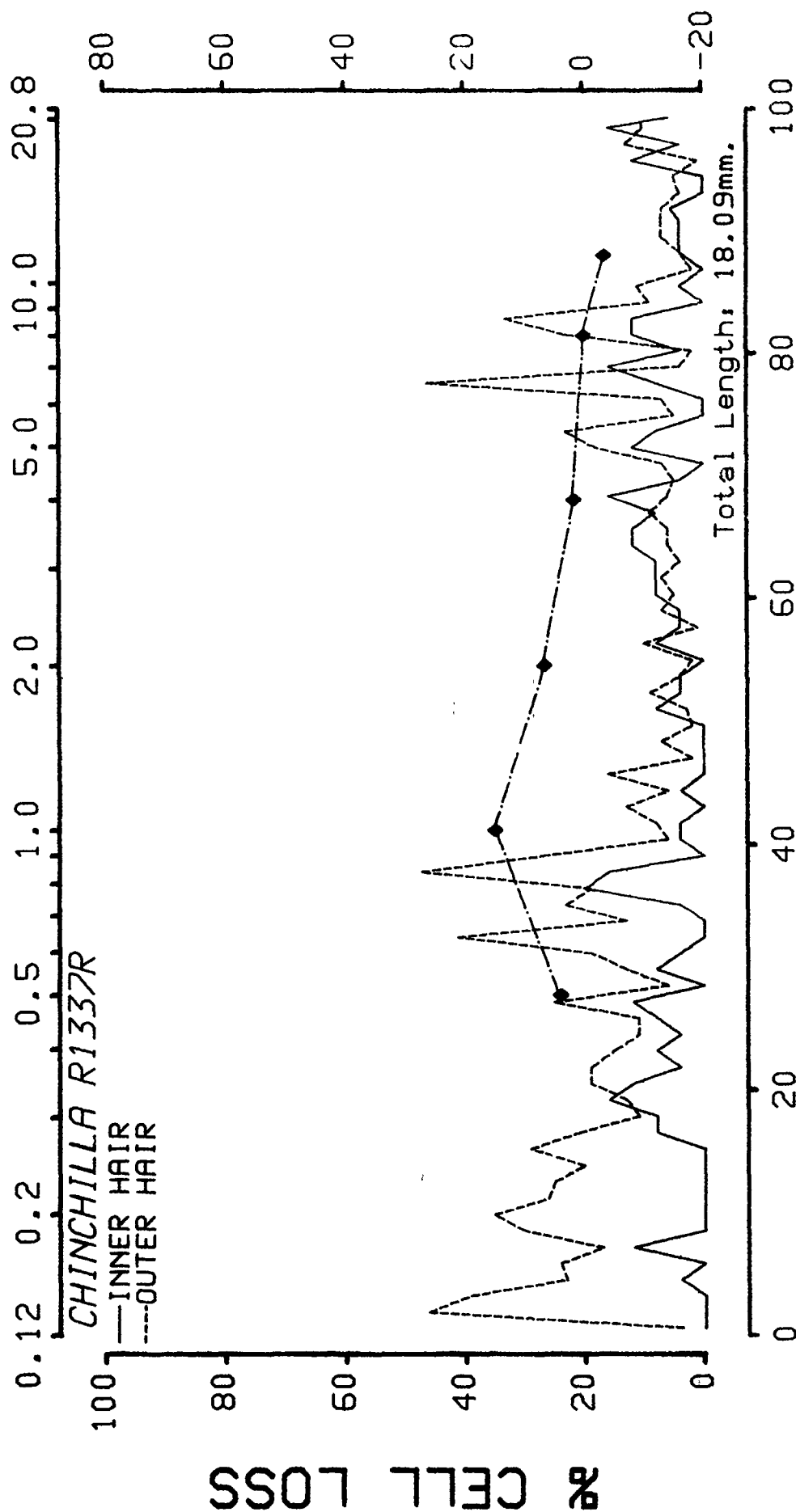


% TOTAL DISTANCE FROM APEX

PTS (dB)

% CELL LOSS

FREQUENCY (kHz)



% TOTAL DISTANCE FROM APEX

Summary Data for the Group Exposed to:

155 dB, 10X, 10/M

Animal

| | | |
|------|---|------------------------------------|
| 1534 | - | Completed the Entire Protocol |
| 1700 | - | Completed the Entire Protocol |
| 1716 | - | Completed the Entire Protocol |
| 1718 | - | Completed the Entire Protocol |
| 1759 | - | Completed the Entire Protocol |
| 1617 | - | Bad Electrode: No Audiometric Data |
| 1646 | - | No Tuning Curves were Collected |

155 dB 10X 10/M

PRE-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1534 | 29.2 | 17.5 | 14.2 | 10.8 | 20.8 | 22.5 | ***** |
| 1700 | 20.8 | 17.5 | 15.8 | -5.8 | 10.8 | 22.5 | ***** |
| 1716 | 22.5 | 12.5 | 14.2 | 9.2 | 25.8 | 24.2 | ***** |
| 1718 | 20.8 | 10.8 | 14.2 | 5.8 | 19.2 | 25.8 | ***** |
| 1759 | 22.5 | 17.5 | 15.0 | 13.8 | 30.0 | 27.5 | ***** |
| Mean | 23.2 | 15.2 | 14.7 | 6.8 | 21.3 | 24.5 | ***** |
| S.D. | 3.5 | 3.3 | 0.7 | 7.6 | 7.3 | 2.2 | ***** |

POST-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1534 | 29.2 | 15.8 | 17.5 | 10.8 | 20.8 | 25.8 | ***** |
| 1700 | 17.5 | 12.5 | 12.5 | 2.5 | 15.8 | 22.5 | ***** |
| 1716 | 32.5 | 27.5 | 19.2 | 20.8 | 39.2 | 30.8 | ***** |
| 1718 | 29.2 | 27.5 | 17.5 | 9.2 | 25.8 | 32.5 | ***** |
| 1759 | 34.2 | 39.2 | 25.8 | 20.8 | 30.8 | 35.8 | ***** |
| Mean | 28.5 | 24.5 | 18.5 | 12.8 | 26.5 | 29.5 | ***** |
| S.D. | 6.5 | 10.6 | 4.8 | 7.9 | 9.0 | 5.3 | ***** |

PERMANENT THRESHOLD SHIFT (dB)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1534 | 0.0 | -1.7 | 3.3 | 0.0 | 0.0 | 3.3 | ***** |
| 1700 | -3.3 | -5.0 | -3.3 | 8.3 | 5.0 | 0.0 | ***** |
| 1716 | 10.0 | 15.0 | 5.0 | 11.7 | 13.3 | 6.7 | ***** |
| 1718 | 8.3 | 16.7 | 3.3 | 3.3 | 6.7 | 6.7 | ***** |
| 1759 | 11.7 | 21.7 | 10.8 | 7.1 | 0.8 | 8.3 | ***** |
| Mean | 5.3 | 9.3 | 3.8 | 6.1 | 5.2 | 5.0 | ***** |
| S.D. | 6.6 | 11.9 | 5.1 | 4.5 | 5.3 | 3.3 | ***** |

155 dB 10X 10/M

TEMPORARY THRESHOLD SHIFT (dB)

| | | Frequency 0.5 kHz | | | | |
|-----------|------|-------------------|------|------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1534 | 3.3 | 8.3 | 8.3 | 8.3 | -1.7 | 8.3 |
| 1700 | 1.7 | 1.7 | 1.7 | -3.3 | -3.3 | 1.7 |
| 1716 | 10.0 | 0.0 | -5.0 | 0.0 | 10.0 | 10.0 |
| 1718 | 31.7 | 74.2* | 21.7 | 26.7 | 16.7 | 74.2 |
| 1759 | 40.0 | 62.5* | 55.0 | 30.0 | 15.0 | 62.5 |
| Mean | 17.3 | 29.3 | 16.3 | 12.3 | 7.3 | 31.3 |
| S.D. | 17.4 | 36.0 | 23.8 | 15.3 | 9.3 | 34.2 |

| | | Frequency 2.0 kHz | | | | |
|-----------|------|-------------------|------|------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1534 | 23.3 | 38.3 | 28.3 | 8.3 | 3.3 | 38.3 |
| 1700 | 6.7 | 1.7 | 1.7 | 1.7 | -3.3 | 6.7 |
| 1716 | 13.3 | -1.7 | -1.7 | -1.7 | 3.3 | 13.3 |
| 1718 | 33.3 | 75.8* | 23.3 | 18.3 | 3.3 | 75.8 |
| 1759 | 47.5 | 52.5 | 37.5 | 22.5 | 12.5 | 52.5 |
| Mean | 24.8 | 33.3 | 17.8 | 9.8 | 3.8 | 37.3 |
| S.D. | 16.2 | 33.3 | 17.1 | 10.4 | 5.6 | 28.4 |

| | | Frequency 8.0 kHz | | | | |
|-----------|------|-------------------|------|------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1534 | 26.7 | 16.7 | 16.7 | 11.7 | 1.7 | 26.7 |
| 1700 | 16.7 | 11.7 | 6.7 | 1.7 | -3.3 | 16.7 |
| 1716 | 6.7 | 6.7 | 11.7 | 11.7 | 1.7 | 11.7 |
| 1718 | 63.3 | 68.3 | 13.3 | 8.3 | 8.3 | 68.3 |
| 1759 | 37.5 | 47.5 | 17.5 | 12.5 | 17.5 | 47.5 |
| Mean | 30.2 | 30.2 | 13.2 | 9.2 | 5.2 | 34.2 |
| S.D. | 21.8 | 26.6 | 4.3 | 4.5 | 8.0 | 23.5 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 10/M

Probe Frequency: 0.5 kHz

| Masker (kHz): | 0.150 | 0.200 | 0.300 | 0.400 | 0.520 | 0.600 | 0.650 | 0.750 | 1.300 | 2.200 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1534 (1.51) | 72.5 | 67.5 | 57.5 | 52.5 | 42.5 | 42.5 | 37.5 | 42.5 | 62.5 | 87.5 |
| 1700 (3.19) | 62.5 | 62.5 | 52.5 | 47.5 | 32.5 | 42.5 | 42.5 | 47.5 | 87.5 | 92.5 |
| 1716 (1.75) | 67.5 | 62.5 | 52.5 | 50.0 | 42.5 | 40.0 | 35.0 | 40.0 | 62.5 | 87.5 |
| 1718 (2.05) | 67.5 | 67.5 | 57.5 | 52.5 | 42.5 | 37.5 | 42.5 | 47.5 | 72.5 | 87.5 |
| 1759 (1.66) | 62.5 | 62.5 | 52.5 | 42.5 | 27.5 | 32.5 | 32.5 | 37.5 | 62.5 | 85.0* |
| Mean (2.05) | 66.5 | 64.5 | 54.5 | 49.0 | 37.5 | 39.0 | 38.0 | 43.0 | 69.5 | 88.0 |
| S.D. (0.66) | 4.2 | 2.7 | 2.7 | 4.2 | 7.1 | 4.2 | 4.5 | 4.5 | 11.0 | 2.7 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1534 (1.78) | 77.5 | 67.5 | 57.5 | 47.5 | 37.5 | 37.5 | 37.5 | 32.5 | 67.5 | 82.5 |
| 1700 (2.09) | 57.5 | 52.5 | 42.5 | 32.5 | 22.5 | 27.5 | 32.5 | 42.5 | 72.5 | 87.5 |
| 1716 (1.77) | 77.5 | 67.5 | 57.5 | 52.5 | 32.5 | 37.5 | 37.5 | 42.5 | 67.5 | 82.5 |
| 1718 (0.71) | 67.5 | 62.5 | 47.5 | 47.5 | 47.5 | 52.5 | 57.5 | 67.5 | 90.0* | 95.0* |
| 1759 (0.59) | 62.5 | 57.5 | 37.5 | 37.5 | 37.5 | 42.5 | 42.5 | 47.5 | 77.5 | 82.5 |
| Mean (1.39) | 68.5 | 61.5 | 48.5 | 43.5 | 35.5 | 39.5 | 41.5 | 46.5 | 75.0 | 86.0 |
| S.D. (0.69) | 8.9 | 6.5 | 8.9 | 8.2 | 9.1 | 9.1 | 9.6 | 12.9 | 9.4 | 5.5 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 10/M

Probe Frequency: 1.0 kHz

| Masker (kHz): | 0.150 | 0.200 | 0.400 | 0.550 | 0.800 | 1.050 | 1.300 | 1.700 | 1.900 | 2.500 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1534 (1.61) | 72.5 | 72.5 | 62.5 | 47.5 | 32.5 | 27.5 | 32.5 | 62.5 | 75.0* | 95.0* |
| 1700 (****) | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 1716 (1.69) | 67.5 | 62.5 | 57.5 | 42.5 | 32.5 | 22.5 | 27.5 | 42.5 | 47.5 | 87.5 |
| 1718 (1.77) | 72.5 | 77.5 | 62.5 | 47.5 | 32.5 | 27.5 | 37.5 | 57.5 | 57.5 | 95.0* |
| 1759 (1.44) | 77.5 | 77.5 | 57.5 | 42.5 | 32.5 | 27.5 | 32.5 | 52.5 | 62.5 | 85.0* |
| Mean (1.63) | 72.5 | 72.5 | 60.0 | 45.0 | 32.5 | 26.3 | 32.5 | 53.8 | 60.6 | 90.6 |
| S.D. (0.14) | 4.1 | 7.1 | 2.9 | 2.9 | 0.0 | 2.5 | 4.1 | 8.5 | 11.4 | 5.2 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1534 (1.93) | 82.5 | 72.5 | 57.5 | 47.5 | 32.5 | 22.5 | 27.5 | 67.5 | 77.5 | 87.5 |
| 1700 (0.92) | 62.5 | 62.5 | 47.5 | 37.5 | 27.5 | 27.5 | 32.5 | 47.5 | 52.5 | 87.5 |
| 1716 (0.85) | 87.5 | 87.5 | 67.5 | 52.5 | 42.5 | 42.5 | 47.5 | 57.5 | 57.5 | 82.5 |
| 1718 (1.59) | 82.5 | 72.5 | 62.5 | 52.5 | 47.5 | 42.5 | 57.5 | 67.5 | 62.5 | 95.0* |
| 1759 (0.79) | 77.5 | 77.5 | 72.5 | 62.5 | 57.5 | 57.5 | 57.5 | 77.5 | 77.5 | 77.5 |
| Mean (1.22) | 78.5 | 74.5 | 61.5 | 50.5 | 41.5 | 38.5 | 44.5 | 63.5 | 65.5 | 86.0 |
| S.D. (0.51) | 9.6 | 9.1 | 9.6 | 9.1 | 11.9 | 13.9 | 14.0 | 11.4 | 11.5 | 6.5 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 10/M

Probe Frequency: 2.0 kHz

Masker (kHz): 0.300 0.750 0.900 1.300 1.700 2.050 2.200 3.000 3.500 4.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|-------|-------|
| 1534 (3.20) | 67.5 | 47.5 | 37.5 | 32.5 | 27.5 | 17.5 | 22.5 | 47.5 | 77.5 | 95.0* |
| 1700 (4.01) | 67.5 | 47.5 | 47.5 | 42.5 | 47.5 | 27.5 | 32.5 | 52.5 | 85.0* | 95.0* |
| 1716 (2.04) | 62.5 | 42.5 | 37.5 | 37.5 | 32.5 | 22.5 | 22.5 | 37.5 | 77.5 | 95.0* |
| 1718 (6.05) | 87.5 | 57.5 | 42.5 | 42.5 | 37.5 | 22.5 | 37.5 | 47.5 | 85.0* | 95.0* |
| 1759 (5.24) | 82.5 | 72.5 | 57.5 | 52.5 | 47.5 | 17.5 | 22.5 | 52.5 | 57.5 | 87.5 |

| | | | | | | | | | | |
|------|---------|------|------|------|------|------|------|------|------|------|
| Mean | (4.11) | 73.5 | 53.5 | 44.5 | 38.5 | 21.5 | 27.5 | 47.5 | 76.5 | 93.5 |
| S.D. | (1.59) | 10.8 | 11.9 | 8.4 | 7.4 | 4.2 | 7.1 | 6.1 | 11.3 | 3.4 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|-------|-------|
| 1534 (4.09) | 67.5 | 47.5 | 42.5 | 32.5 | 27.5 | 17.5 | 27.5 | 52.5 | 77.5 | 95.0* |
| 1700 (4.09) | 62.5 | 42.5 | 42.5 | 37.5 | 32.5 | 22.5 | 32.5 | 47.5 | 72.5 | 95.0* |
| 1716 (3.42) | 82.5 | 67.5 | 62.5 | 57.5 | 47.5 | 32.5 | 27.5 | 47.5 | 72.5 | 95.0* |
| 1718 (9.19) | 67.5 | 47.5 | 37.5 | 42.5 | 52.5 | 22.5 | 37.5 | 47.5 | 85.0* | 95.0* |
| 1759 (8.33) | 67.5 | 42.5 | 37.5 | 42.5 | 52.5 | 27.5 | 42.5 | 32.5 | 37.5 | 95.0* |

| | | | | | | | | | | |
|------|---------|------|------|------|------|------|------|------|------|------|
| Mean | (5.83) | 69.5 | 49.5 | 44.5 | 42.5 | 24.5 | 33.5 | 45.5 | 69.0 | 95.0 |
| S.D. | (2.71) | 7.6 | 10.4 | 10.4 | 9.4 | 5.7 | 6.5 | 7.6 | 18.3 | 0.0 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 10/M

Probe Frequency: 4.0 kHz

| Masker (kHz): | 0.450 | 1.300 | 2.200 | 3.000 | 3.500 | 4.100 | 4.500 | 5.000 | 5.600 | 6.000 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1534 (3.95) | 77.5 | 47.5 | 47.5 | 42.5 | 27.5 | 22.5 | 37.5 | 47.5 | 52.5 | 62.5 |
| 1700 (4.76) | 77.5 | 57.5 | 47.5 | 47.5 | 37.5 | 27.5 | 42.5 | 62.5 | 67.5 | 67.5 |
| 1716 (2.73) | 67.5 | 57.5 | 47.5 | 37.5 | 32.5 | 27.5 | 37.5 | 57.5 | 72.5 | 82.5 |
| 1718 (3.26) | 72.5 | 52.5 | 52.5 | 42.5 | 32.5 | 27.5 | 37.5 | 47.5 | 57.5 | 67.5 |
| 1759 (2.73) | 77.5 | 57.5 | 52.5 | 37.5 | 32.5 | 27.5 | 37.5 | 57.5 | 57.5 | 72.5 |
| Mean (3.49) | 74.5 | 54.5 | 49.5 | 41.5 | 32.5 | 26.5 | 38.5 | 54.5 | 61.5 | 70.5 |
| S.D. (0.87) | 4.5 | 4.5 | 2.7 | 4.2 | 3.5 | 2.2 | 2.2 | 6.7 | 8.2 | 7.6 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1534 (3.23) | 77.5 | 57.5 | 57.5 | 37.5 | 22.5 | 17.5 | 22.5 | 47.5 | 72.5 | 72.5 |
| 1700 (3.49) | 67.5 | 57.5 | 52.5 | 42.5 | 27.5 | 22.5 | 32.5 | 57.5 | 72.5 | 85.0* |
| 1716 (3.65) | 77.5 | 67.5 | 62.5 | 52.5 | 42.5 | 37.5 | 52.5 | 67.5 | 77.5 | 95.0* |
| 1718 (2.73) | 82.5 | 52.5 | 52.5 | 37.5 | 32.5 | 27.5 | 37.5 | 52.5 | 62.5 | 87.5 |
| 1759 (3.65) | 95.0* | 62.5 | 57.5 | 47.5 | 37.5 | 32.5 | 47.5 | 52.5 | 67.5 | 95.0* |
| Mean (3.35) | 80.0 | 59.5 | 56.5 | 43.5 | 32.5 | 27.5 | 38.5 | 55.5 | 70.5 | 87.0 |
| S.D. (0.39) | 10.0 | 5.7 | 4.2 | 6.5 | 7.9 | 7.9 | 11.9 | 7.6 | 5.7 | 9.3 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 10/M

Probe Frequency: 8.0 kHz

| Masker (kHz): | 0.450 | 1.300 | 2.500 | 5.900 | 7.000 | 8.100 | 9.300 | 11.000 | 12.700 | 14.000 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1534 (6.87) | 67.5 | 47.5 | 57.5 | 52.5 | 27.5 | 32.5 | 17.5 | 47.5 | 57.5 | 87.5 |
| 1700 (2.52) | 72.5 | 62.5 | 62.5 | 47.5 | 37.5 | 37.5 | 57.5 | 62.5 | 67.5 | 77.5 |
| 1716 (1.30) | 77.5 | 67.5 | 62.5 | 47.5 | 42.5 | 42.5 | 45.0 | 67.5 | 85.0* | 95.0* |
| 1718 (2.52) | 82.5 | 62.5 | 57.5 | 32.5 | 22.5 | 27.5 | 37.5 | 47.5 | 62.5 | 67.5 |
| 1759 (5.99) | 85.0* | 62.5 | 62.5 | 47.5 | 52.5 | 32.5 | 47.5 | 57.5 | 77.5 | 95.0* |
| Mean (3.84) | 77.0 | 60.5 | 60.5 | 45.5 | 36.5 | 34.5 | 41.0 | 56.5 | 70.0 | 84.5 |
| S.D. (2.44) | 7.2 | 7.6 | 2.7 | 7.6 | 11.9 | 5.7 | 15.0 | 8.9 | 11.2 | 11.9 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1534 (3.01) | 87.5 | 62.5 | 57.5 | 42.5 | 27.5 | 22.5 | 32.5 | 62.5 | 85.0* | 95.0* |
| 1700 (1.34) | 72.5 | 67.5 | 62.5 | 37.5 | 37.5 | 32.5 | 32.5 | 42.5 | 57.5 | 47.5 |
| 1716 (0.99) | 87.5 | 72.5 | 67.5 | 52.5 | 57.5 | 52.5 | 62.5 | 85.0* | 95.0* | 95.0* |
| 1718 (3.18) | 87.5 | 62.5 | 62.5 | 47.5 | 37.5 | 47.5 | 52.5 | 75.0* | 85.0* | 95.0* |
| 1759 (2.29) | 95.0* | 67.5 | 62.5 | 57.5 | 42.5 | 42.5 | 52.5 | 67.5 | 85.0* | 95.0* |
| Mean (2.16) | 86.0 | 66.5 | 62.5 | 47.5 | 40.5 | 39.5 | 46.5 | 66.5 | 81.5 | 85.5 |
| S.D. (0.98) | 8.2 | 4.2 | 3.5 | 7.9 | 11.0 | 12.0 | 13.4 | 15.9 | 14.1 | 21.2 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 10/M

Probe Frequency: 11.2 kHz

Masker (kHz): 1.000 4.000 7.000 9.000 11.000 11.500 12.000 13.000 14.500 16.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| 1534 (8.68) | 72.5 | 52.5 | 47.5 | 37.5 | 27.5 | 17.5 | 22.5 | 37.5 | 37.5 | 72.5 |
| 1700 (5.75) | 62.5 | 52.5 | 57.5 | 67.5 | 47.5 | 37.5 | 37.5 | 47.5 | 62.5 | 72.5 |
| 1716 (3.61) | 72.5 | 52.5 | 52.5 | 52.5 | 32.5 | 37.5 | 37.5 | 42.5 | 52.5 | 72.5 |
| 1718 (3.26) | 77.5 | 52.5 | 57.5 | 57.5 | 42.5 | 42.5 | 42.5 | 52.5 | 57.5 | 87.5 |
| 1759 (6.85) | 77.5 | 52.5 | 67.5 | 52.5 | 47.5 | 37.5 | 32.5 | 42.5 | 57.5 | 72.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (5.63) | 72.5 | 52.5 | 56.5 | 53.5 | 39.5 | 34.5 | 34.5 | 44.5 | 53.5 | 75.5 |
| S.D. (2.27) | 6.1 | 0.0 | 7.4 | 10.8 | 9.1 | 9.7 | 7.6 | 5.7 | 9.6 | 6.7 |

Animal (Q-10 dB)

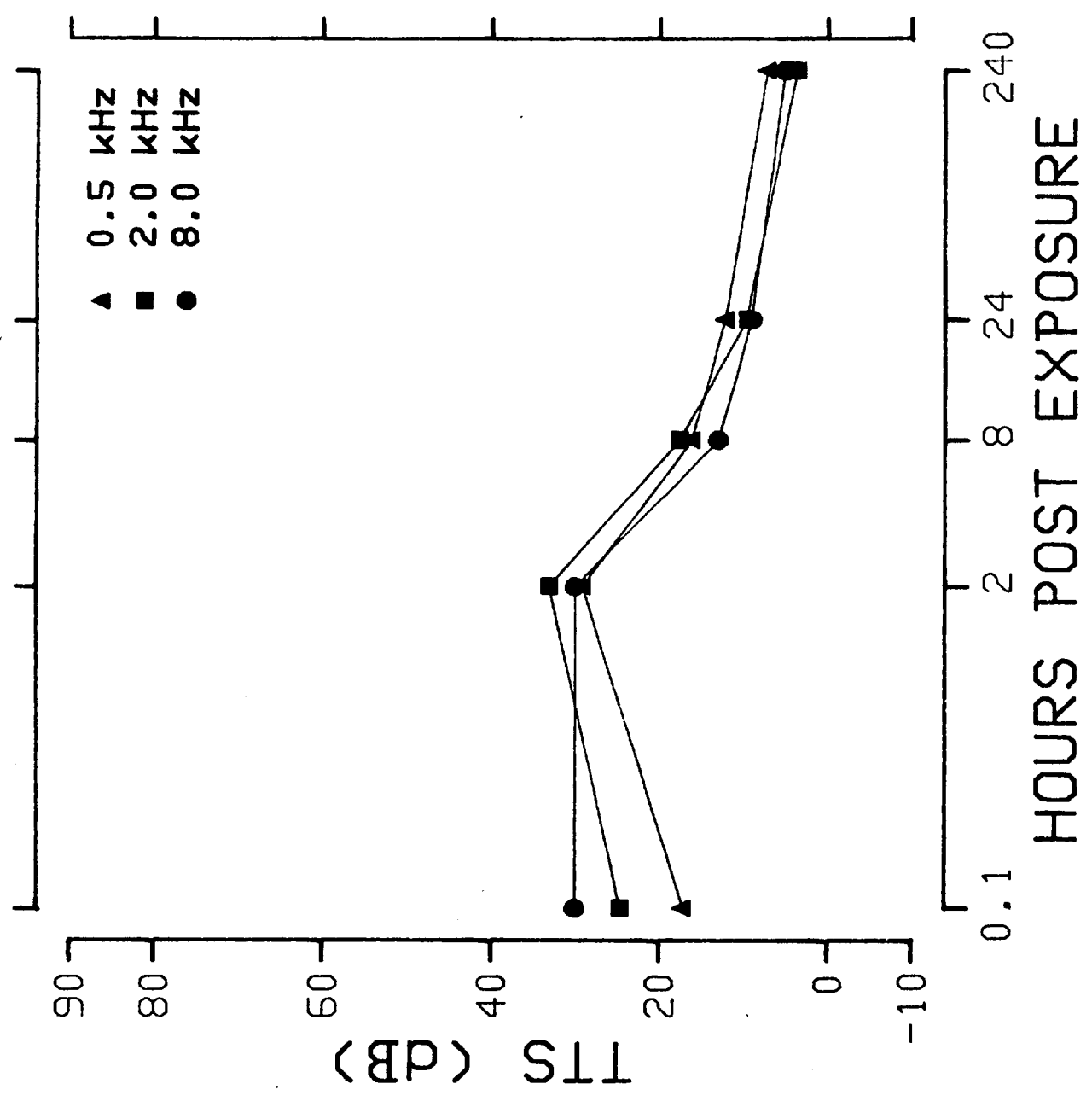
Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|-------|------|------|------|------|-------|-------|
| 1534 (5.08) | 72.5 | 57.5 | 62.5 | 37.5 | 32.5 | 27.5 | 22.5 | 27.5 | 47.5 | 87.5 |
| 1700 (8.15) | 57.5 | 47.5 | 57.5 | 42.5 | 17.5 | 27.5 | 32.5 | 42.5 | 47.5 | 87.5 |
| 1716 (4.57) | 77.5 | 52.5 | 57.5 | 77.5 | 47.5 | 42.5 | 47.5 | 47.5 | 95.0* | 95.0* |
| 1718 (7.09) | 67.5 | 52.5 | 52.5 | 52.5 | 32.5 | 42.5 | 42.5 | 42.5 | 47.5 | 87.5 |
| 1759 (4.64) | 72.5 | 57.5 | 67.5 | 65.0* | 42.5 | 37.5 | 37.5 | 47.5 | 62.5 | 67.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (5.91) | 69.5 | 53.5 | 59.5 | 55.0 | 34.5 | 35.5 | 36.5 | 41.5 | 60.0 | 85.0 |
| S.D. (1.62) | 7.6 | 4.2 | 5.7 | 16.4 | 11.5 | 7.6 | 9.6 | 8.2 | 20.6 | 10.3 |

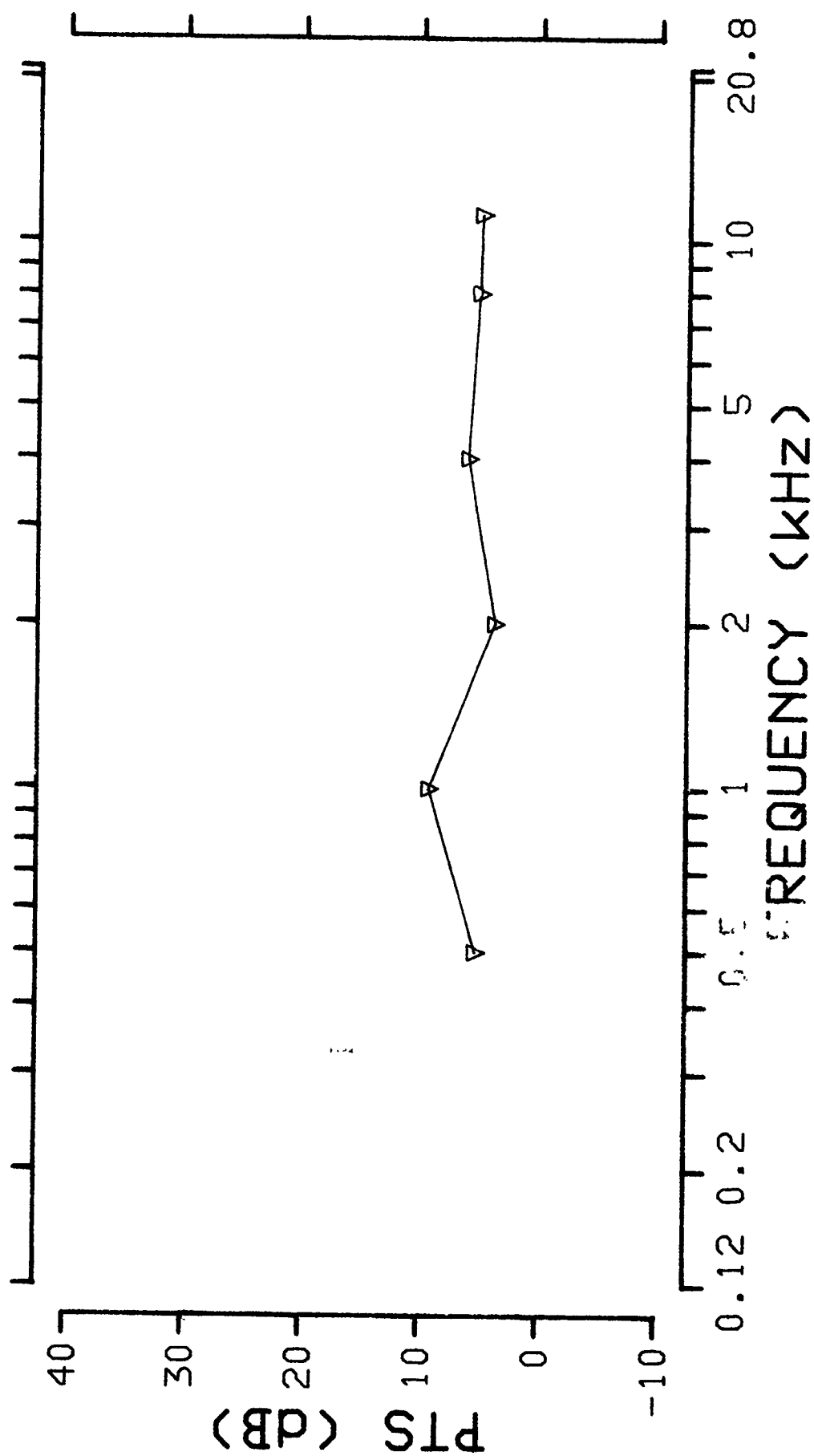
The Group Mean Recovery Curves
Measured at Three Test Frequencies

MEAN DATA (n=5) - 155 dB 10X 10/M



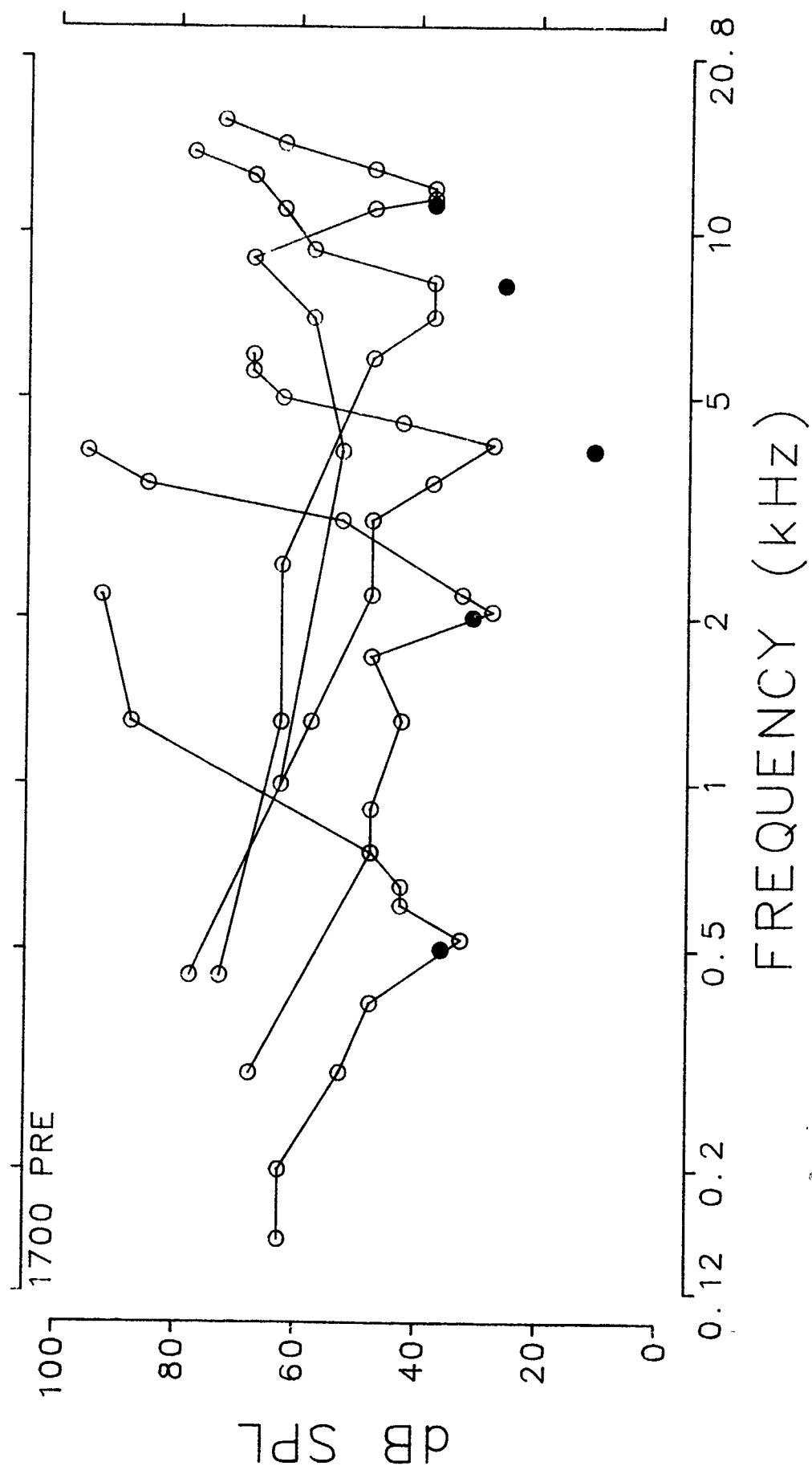
The Group Mean Permanent Threshold Shift (PTS)
for all Test Frequencies

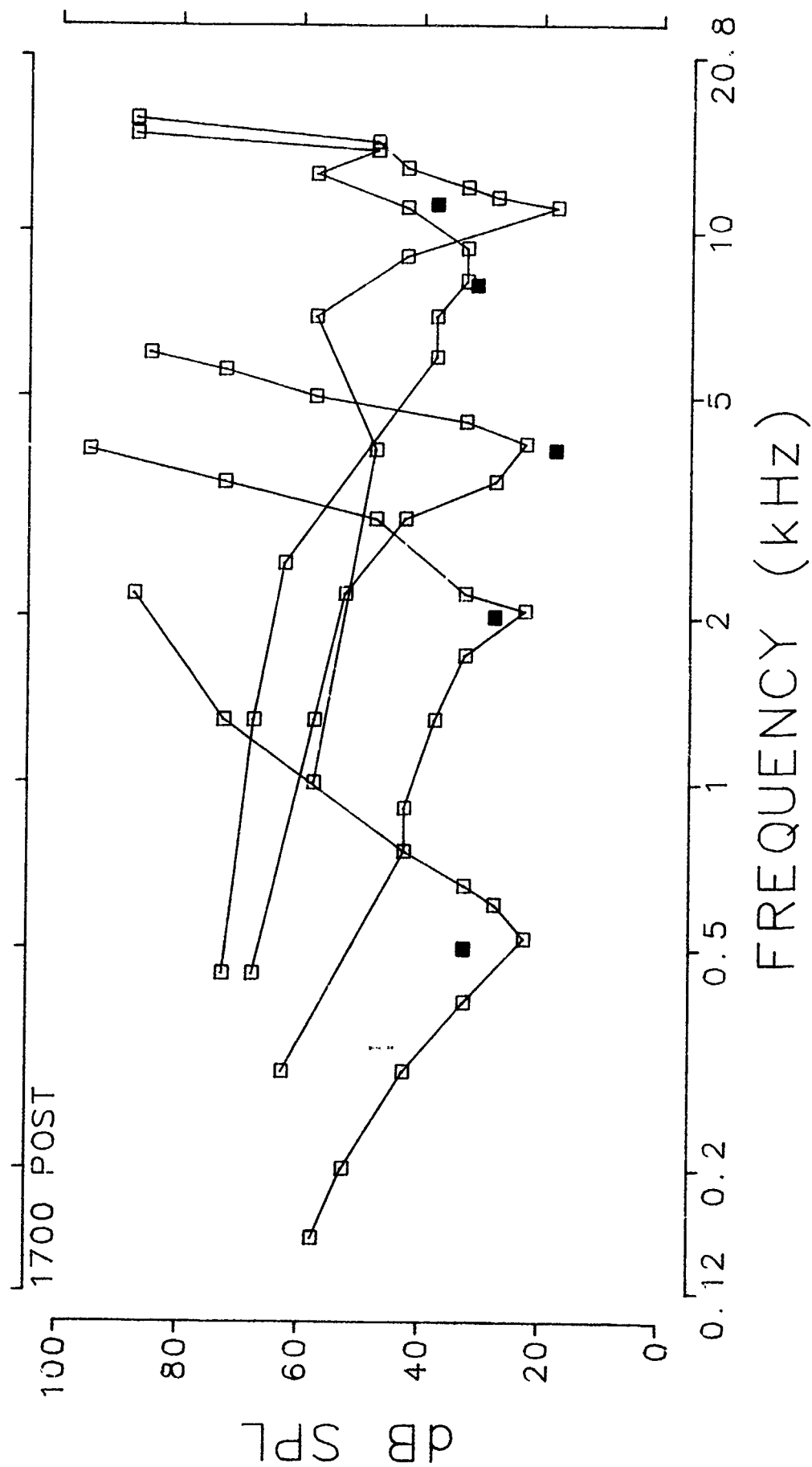
MEAN DATA (n=5) - 155 dB 10X 10/M

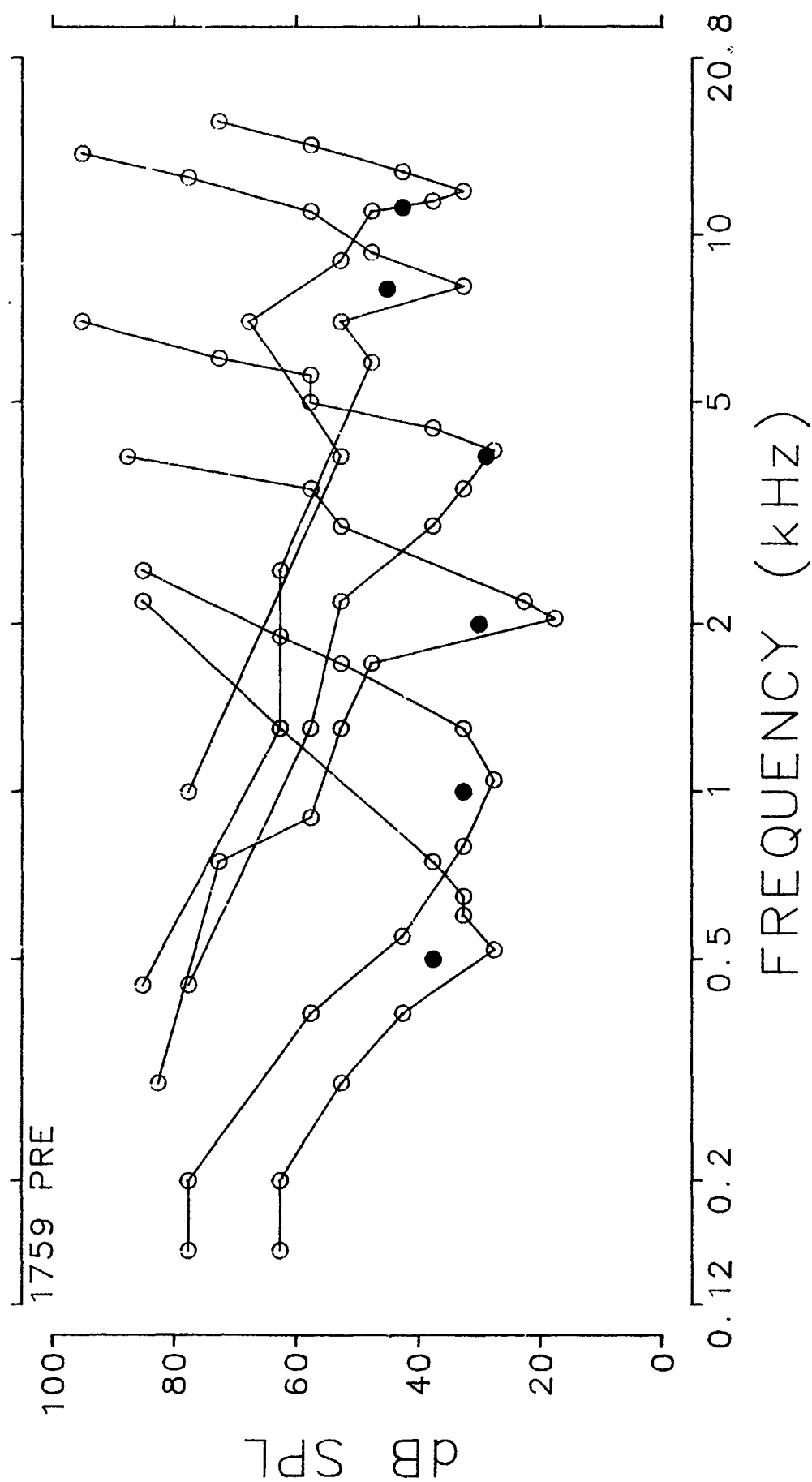


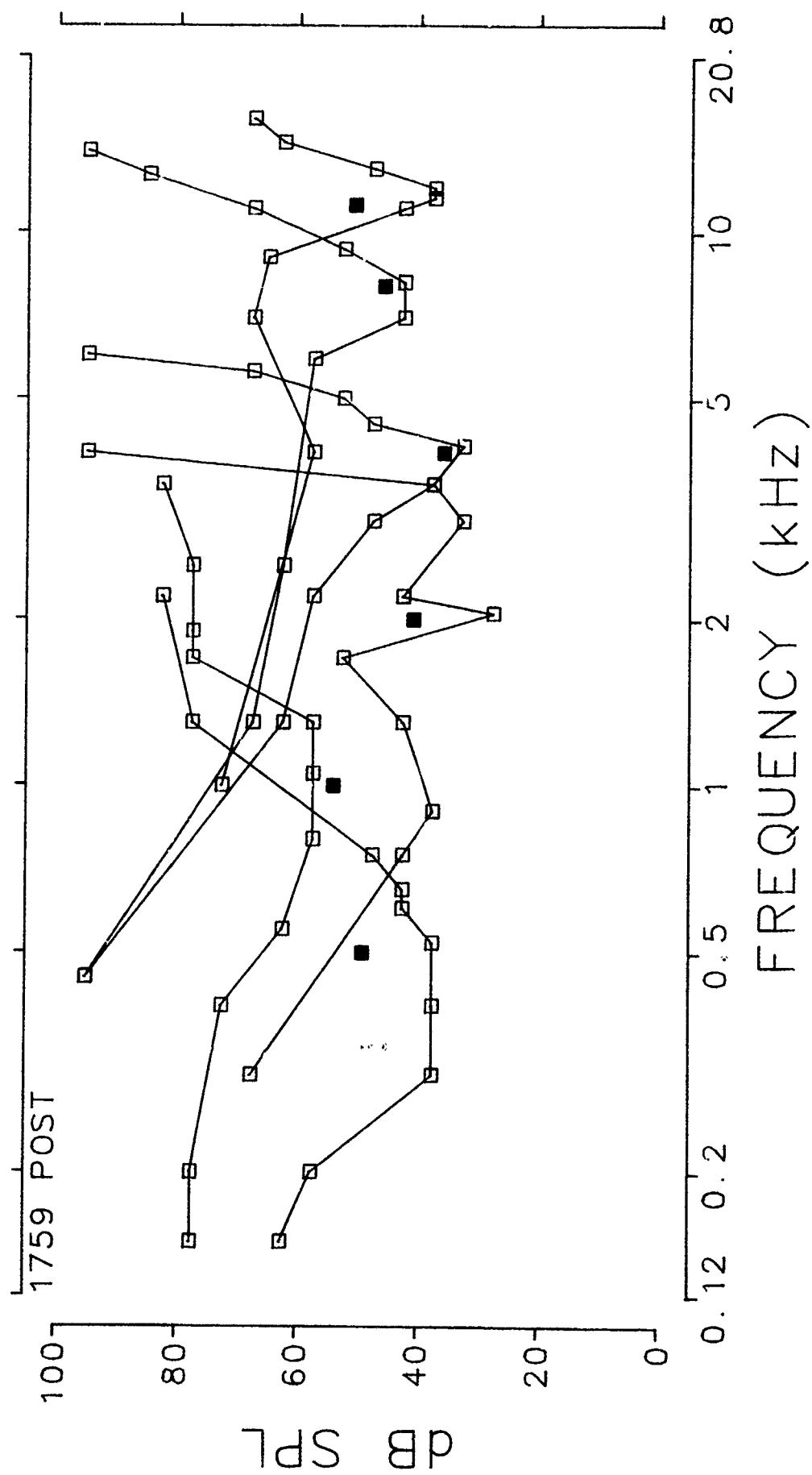
The Pre and Postexposure Tuning Curves for
Individual Animals in this Exposure Group.

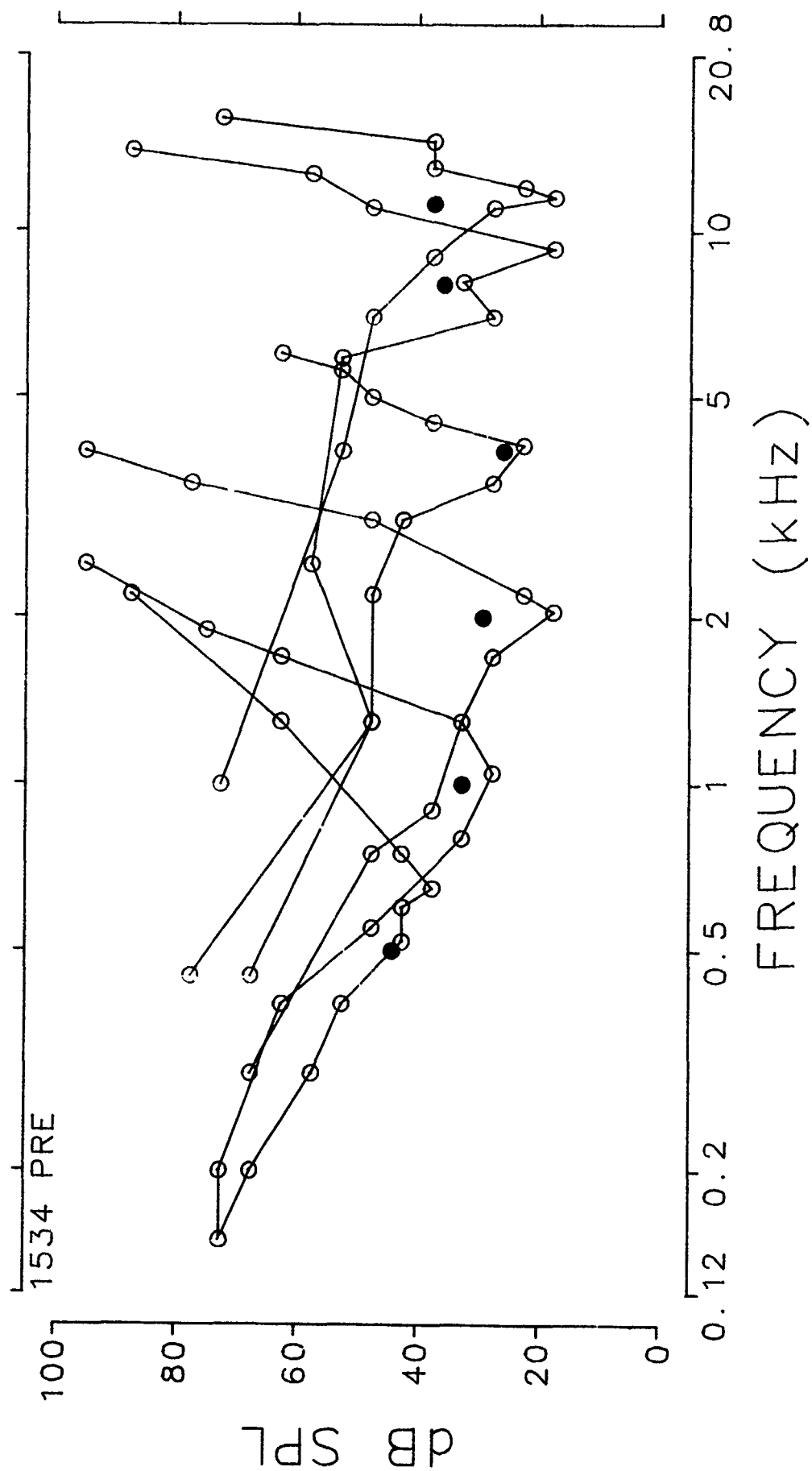
The solid symbol represents the threshold of the probe tone.

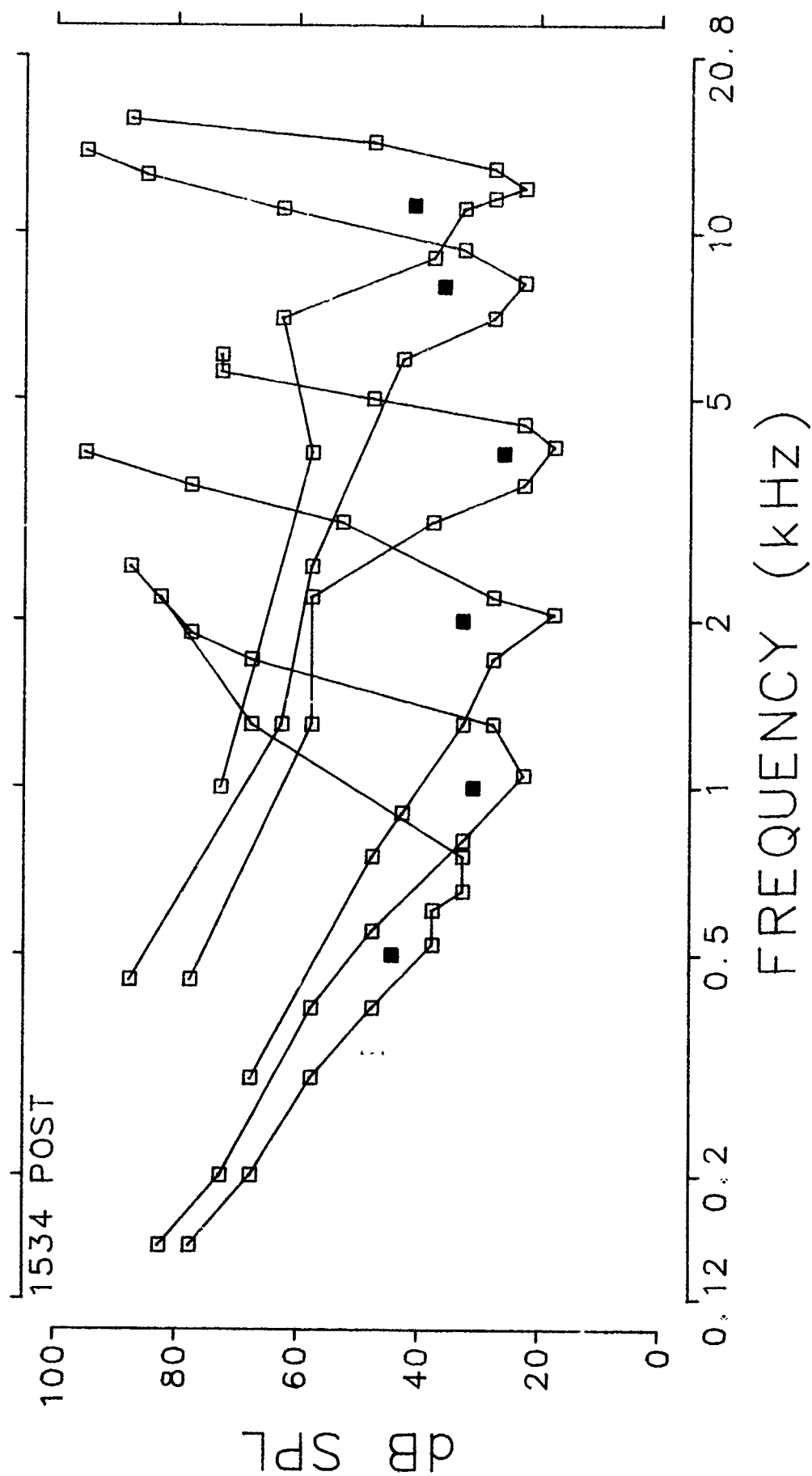


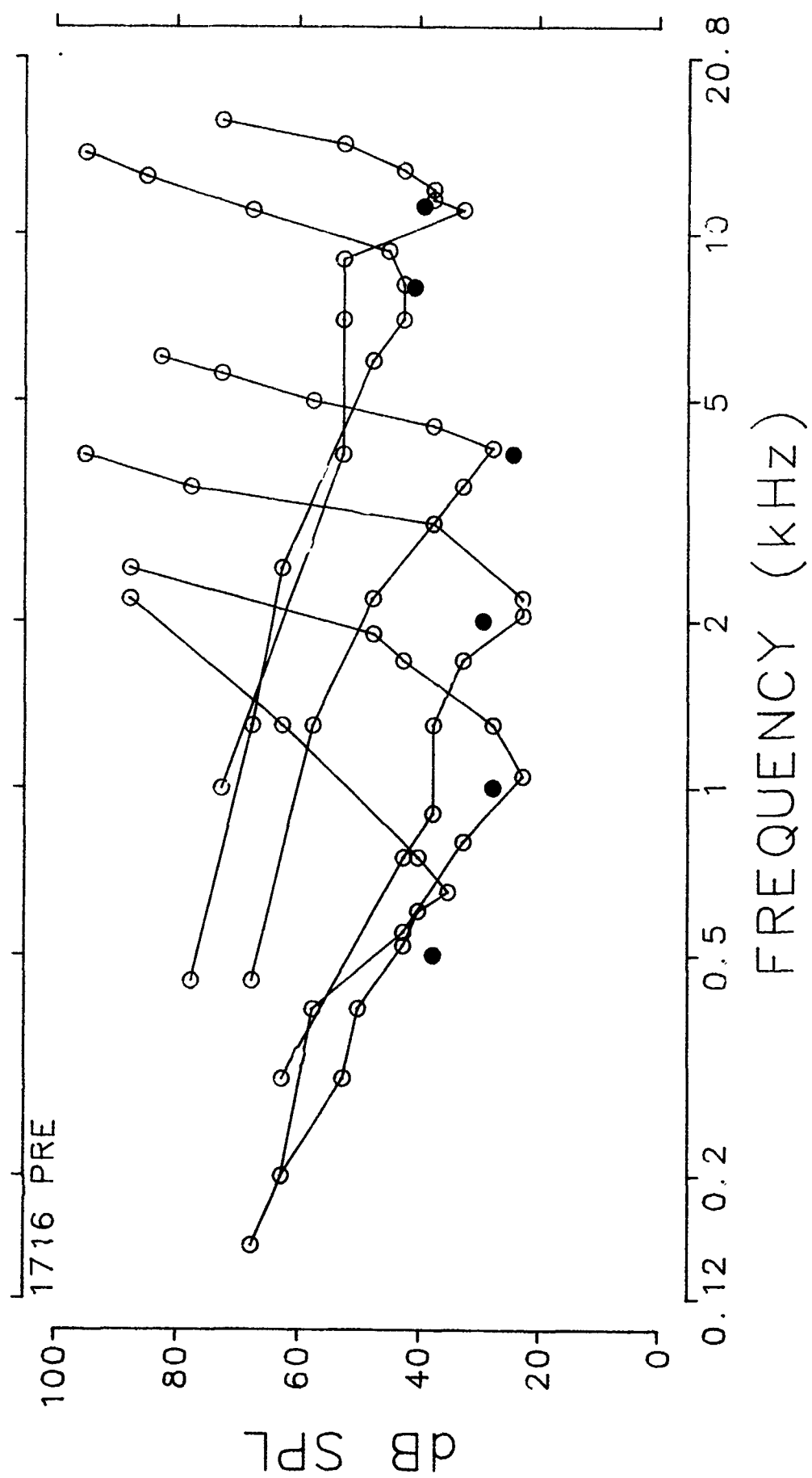


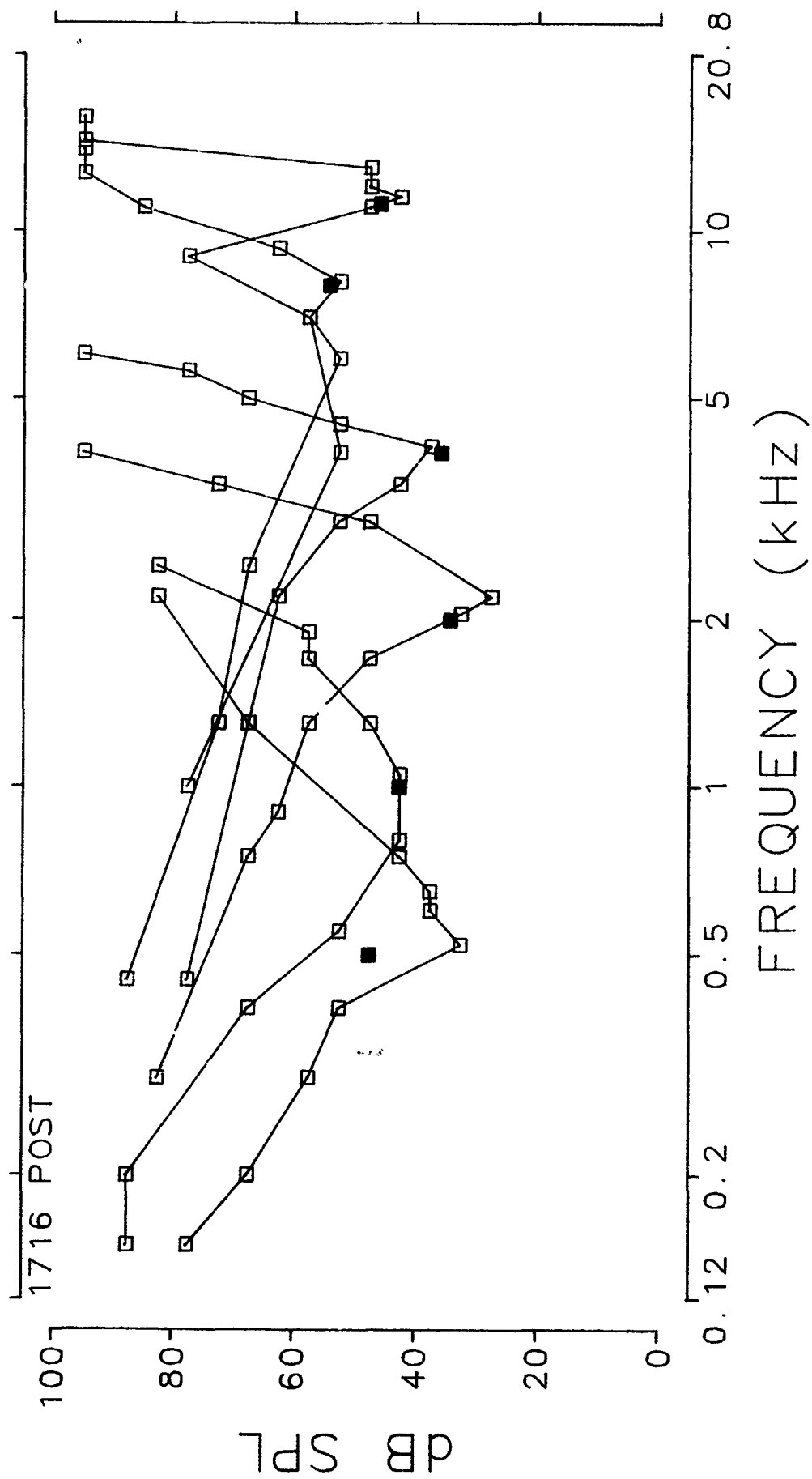


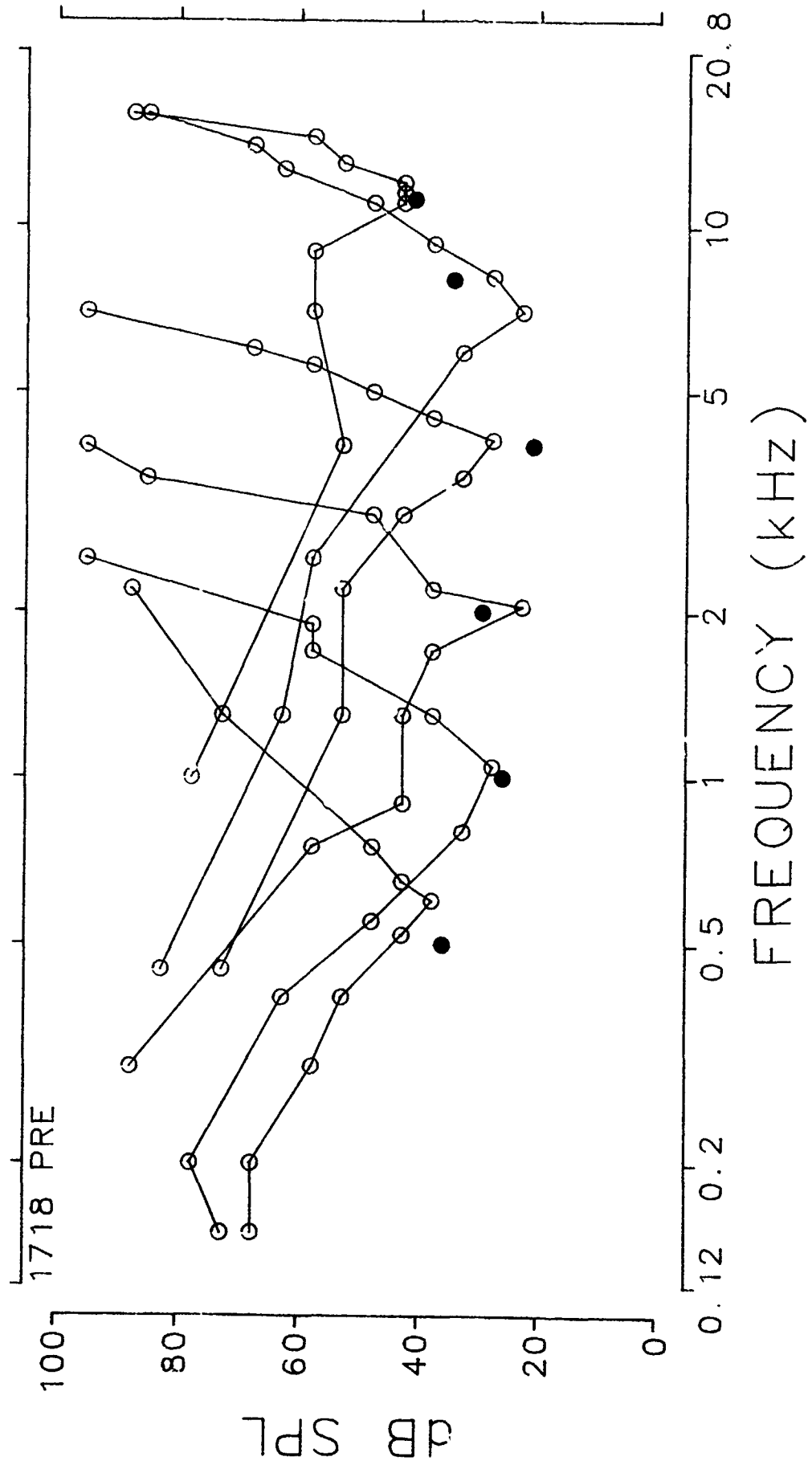


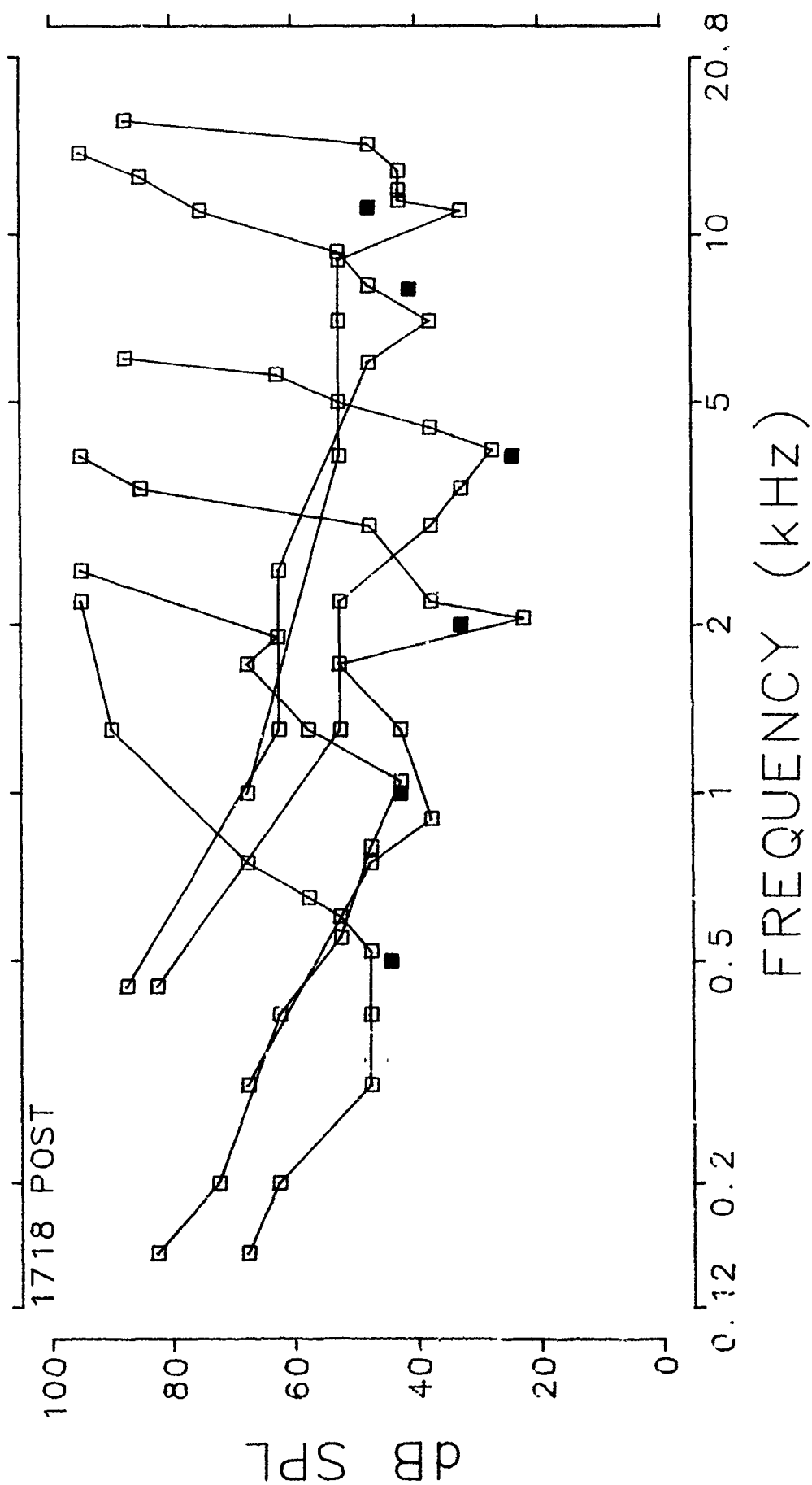












SHOCK TUBE EXPOSURE
155 dB, 10X, 10/MIN

TOTAL NUMBER OF COCHLEAR SENSORY CELLS MISSING

| ANIMAL NUMBER | INNER HAIR CELLS | 1ST ROW OUTER HAIR CELLS | 2ND ROW OUTER HAIR CELLS | 3RD ROW OUTER HAIR CELLS | TOTAL OUTER HAIR CELLS |
|------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------------------------|
| R1534R | 18 | 66 | 127 | 146 | 339 |
| R1617R | 130 | 865 | 950 | 805 | 2620 |
| R1646R | 15 | 86 | 102 | 230 | 418 |
| R1700R | 6 | 26 | 36 | 44 | 106 |
| R1716R | 14 | 106 | 151 | 301 | 558 |
| R1718R | 55 | 376 | 506 | 217 | 1099 |
| R1759R | 14 | 408 | 384 | 163 | 955 |
| GROUP MEAN | 36 | | | | 871 |
| S.D. | 44 | | | | 846 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND LENGTHS OF THE
COCHLEA CENTERED AT THE FREQUENCIES INDICATED

| GROUP MEANS | OCTAVE BAND CENTER FREQUENCY | INNER HAIR CELLS | OUTER HAIR CELLS |
|-------------|------------------------------------|------------------------|------------------------|
| | 0.125 kHz | 3.1 | 97.3 |
| | 0.25 kHz | 2.9 | 63.0 |
| | 0.5 kHz | 1.9 | 70.9 |
| | 1 kHz | 6.1 | 251.4 |
| | 2 kHz | 2.7 | 237.1 |
| | 4 kHz | 15.7 | 123.7 |
| | 8 kHz | 2.9 | 19.4 |
| | 16 kHz | .6 | 6.4 |

STANDARD DEVIATIONS

| | | |
|-----------|------|-------|
| 0.125 kHz | 2.6 | 34.8 |
| 0.25 kHz | 2.0 | 49.1 |
| 0.5 kHz | 2.3 | 43.8 |
| 1 kHz | 11.1 | 287.5 |
| 2 kHz | 3.1 | 315.8 |
| 4 kHz | 38.9 | 277.9 |
| 8 kHz | 4.0 | 13.7 |
| 16 kHz | 1.1 | 6.7 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1534R | | | | | | | |
| 0.125 kHz | 5 | 15 | 29 | 52 | 96 | 0 | 0 |
| 0.25 kHz | 3 | 5 | 10 | 37 | 52 | 0 | 0 |
| 0.5 kHz | 6 | 4 | 14 | 11 | 29 | 0 | 1 |
| 1 kHz | 1 | 16 | 16 | 11 | 43 | 4 | 1 |
| 2 kHz | 1 | 11 | 18 | 14 | 43 | 1 | 0 |
| 4 kHz | 0 | 9 | 26 | 12 | 47 | 1 | 0 |
| 8 kHz | 2 | 5 | 13 | 7 | 25 | 1 | 0 |
| 16 kHz | 0 | 1 | 1 | 2 | 4 | 0 | 0 |
| TOTALS | 18 | 66 | 127 | 146 | 339 | 7 | 2 |

CHINCHILLA R1617R

| | | | | | | | |
|-----------|-----|-----|-----|-----|------|-----|-----|
| 0.125 kHz | 2 | 4 | 34 | 30 | 68 | 0 | 0 |
| 0.25 kHz | 0 | 6 | 3 | 26 | 35 | 0 | 0 |
| 0.5 kHz | 0 | 9 | 73 | 17 | 99 | 0 | 0 |
| 1 kHz | 4 | 258 | 259 | 213 | 730 | 3 | 13 |
| 2 kHz | 9 | 309 | 310 | 274 | 893 | 8 | 36 |
| 4 kHz | 104 | 265 | 258 | 230 | 753 | 191 | 151 |
| 8 kHz | 11 | 13 | 13 | 15 | 41 | 4 | 6 |
| 16 kHz | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| TOTALS | 130 | 865 | 950 | 805 | 2620 | 206 | 206 |

CHINCHILLA R1646R

| | | | | | | | |
|-----------|----|----|-----|-----|-----|----|---|
| 0.125 kHz | 2 | 18 | 38 | 85 | 141 | 2 | 2 |
| 0.25 kHz | 2 | 8 | 22 | 61 | 91 | 0 | 0 |
| 0.5 kHz | 3 | 6 | 10 | 27 | 43 | 1 | 0 |
| 1 kHz | 3 | 7 | 6 | 21 | 34 | 3 | 1 |
| 2 kHz | 3 | 29 | 4 | 13 | 46 | 13 | 0 |
| 4 kHz | 1 | 12 | 6 | 7 | 25 | 3 | 0 |
| 8 kHz | 0 | 4 | 11 | 9 | 24 | 0 | 0 |
| 16 kHz | 1 | 2 | 5 | 7 | 14 | 0 | 0 |
| TOTALS | 15 | 86 | 102 | 230 | 418 | 22 | 3 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1700R | | | | | | | |
| 0.125 kHz | 0 | 6 | 22 | 14 | 42 | 0 | 0 |
| 0.25 kHz | 2 | 1 | 0 | 14 | 15 | 0 | 0 |
| 0.5 kHz | 0 | 5 | 7 | 3 | 15 | 0 | 0 |
| 1 kHz | 0 | 4 | 3 | 0 | 7 | 0 | 0 |
| 2 kHz | 1 | 7 | 1 | 6 | 14 | 0 | 0 |
| 4 kHz | 2 | 1 | 2 | 2 | 5 | 0 | 0 |
| 8 kHz | 1 | 1 | 0 | 4 | 5 | 0 | 0 |
| 16 kHz | 0 | 0 | 1 | 1 | 2 | 0 | 0 |
| TOTALS | 6 | 26 | 36 | 44 | 106 | 0 | 0 |

CHINCHILLA R1716R

| | | | | | | | |
|-----------|----|-----|-----|-----|-----|---|---|
| 0.125 kHz | 3 | 23 | 16 | 50 | 89 | 2 | 2 |
| 0.25 kHz | 2 | 23 | 32 | 106 | 161 | 1 | 0 |
| 0.5 kHz | 1 | 21 | 59 | 46 | 126 | 1 | 3 |
| 1 kHz | 1 | 7 | 15 | 30 | 52 | 0 | 2 |
| 2 kHz | 1 | 13 | 16 | 28 | 57 | 1 | 0 |
| 4 kHz | 2 | 4 | 4 | 16 | 24 | 0 | 0 |
| 8 kHz | 1 | 4 | 4 | 20 | 28 | 0 | 0 |
| 16 kHz | 3 | 9 | 5 | 4 | 18 | 0 | 0 |
| TOTALS | 14 | 106 | 151 | 301 | 558 | 5 | 7 |

CHINCHILLA R1718R

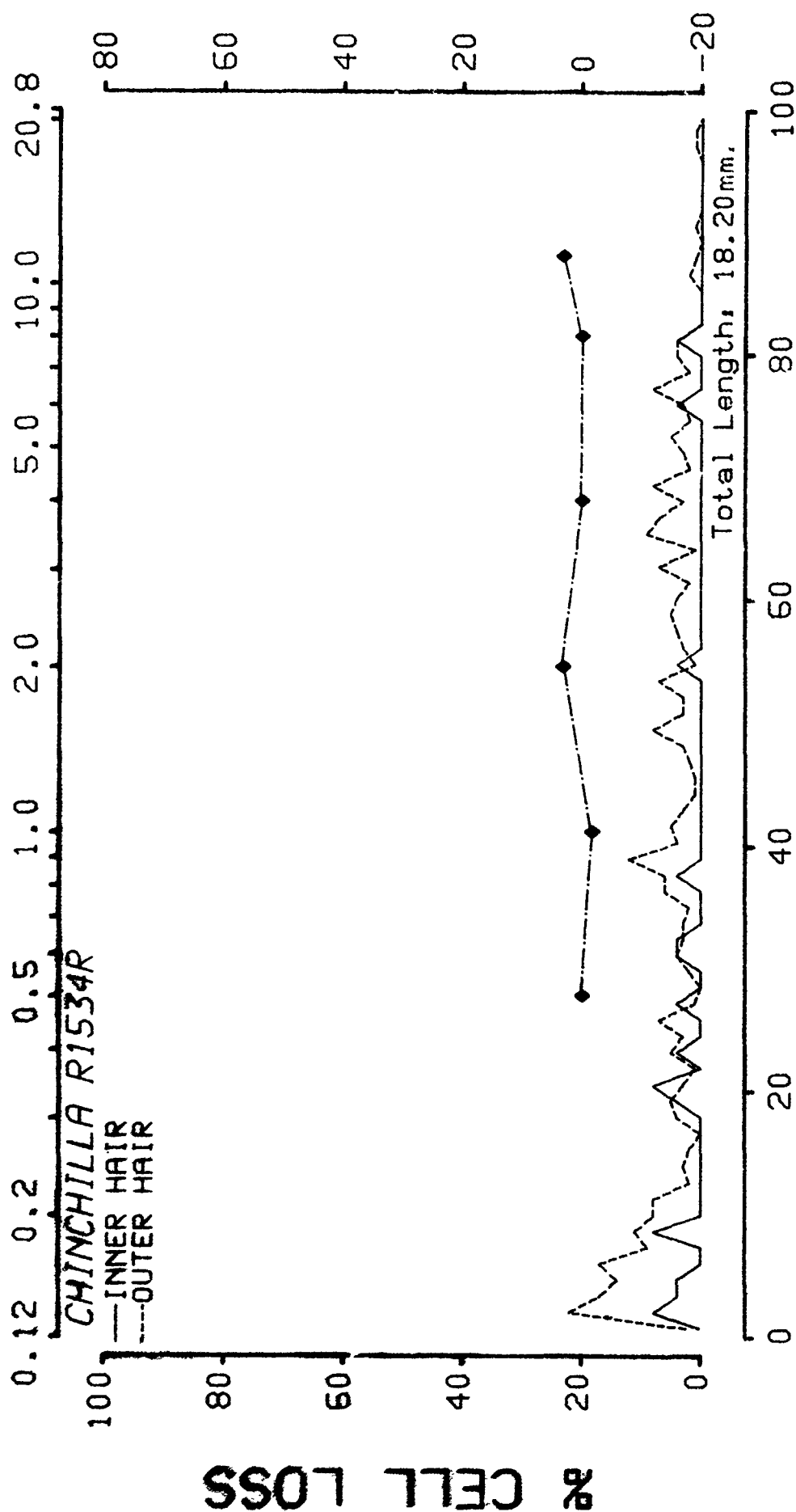
| | | | | | | | |
|-----------|----|-----|-----|-----|------|----|-----|
| 0.125 kHz | 8 | 18 | 50 | 62 | 130 | 4 | 30 |
| 0.25 kHz | 6 | 8 | 14 | 28 | 50 | 0 | 0 |
| 0.5 kHz | 0 | 23 | 60 | 33 | 116 | 0 | 6 |
| 1 kHz | 31 | 155 | 211 | 79 | 445 | 67 | 54 |
| 2 kHz | 4 | 164 | 168 | 10 | 342 | 1 | 13 |
| 4 kHz | 0 | 2 | 1 | 1 | 4 | 0 | 0 |
| 8 kHz | 5 | 2 | 2 | 3 | 7 | 0 | 0 |
| 16 kHz | 0 | 2 | 0 | 1 | 3 | 0 | 0 |
| TOTALS | 55 | 376 | 506 | 217 | 1099 | 72 | 103 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1759R | | | | | | | |
| 0.125 kHz | 2 | 12 | 43 | 60 | 115 | 0 | 0 |
| 0.25 kHz | 5 | 5 | 11 | 21 | 37 | 0 | 0 |
| 0.5 kHz | 3 | 33 | 24 | 11 | 68 | 0 | 0 |
| 1 kHz | 3 | 226 | 190 | 33 | 449 | 0 | 0 |
| 2 kHz | 0 | 124 | 112 | 29 | 265 | 0 | 3 |
| 4 kHz | 1 | 1 | 3 | 4 | 8 | 0 | 0 |
| 8 kHz | 0 | 2 | 0 | 4 | 6 | 0 | 0 |
| 16 kHz | 0 | 2 | 0 | 1 | 3 | 0 | 0 |
| TOTALS | 14 | 408 | 384 | 163 | 955 | 0 | 3 |

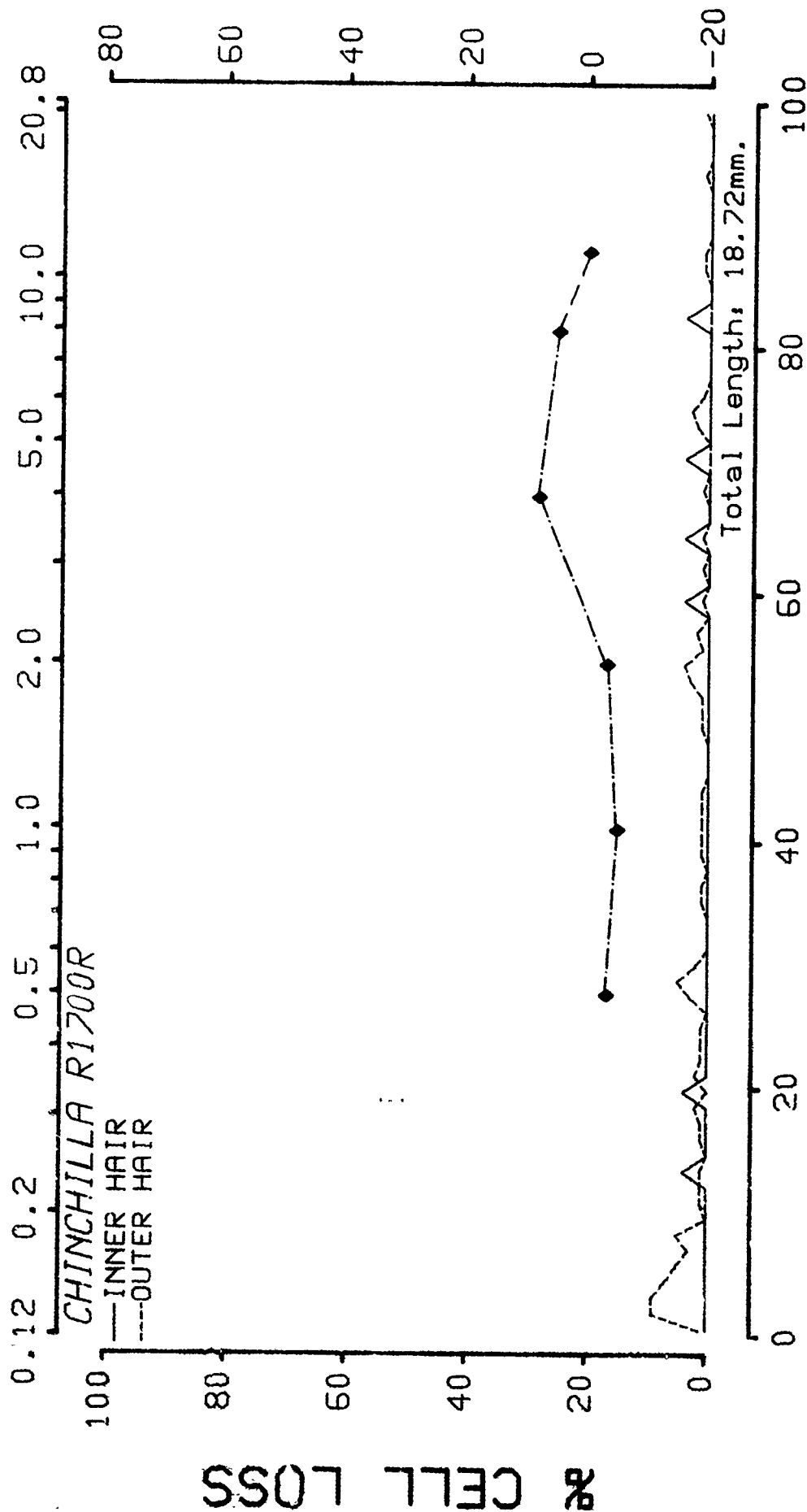
Cochleograms and PTS Audiograms
for Individual Animals

FREQUENCY (kHz)

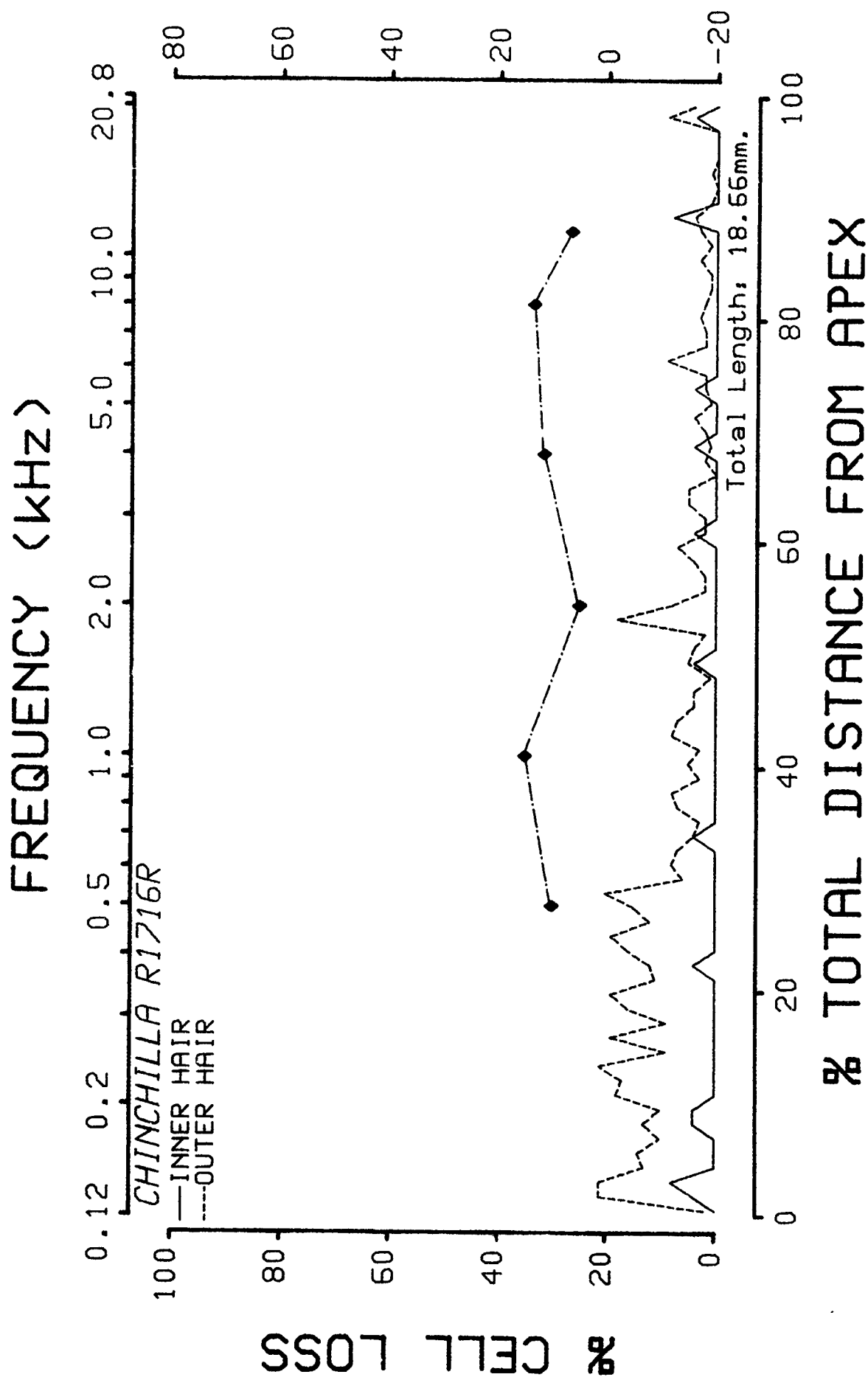


% TOTAL DISTANCE FROM APEX

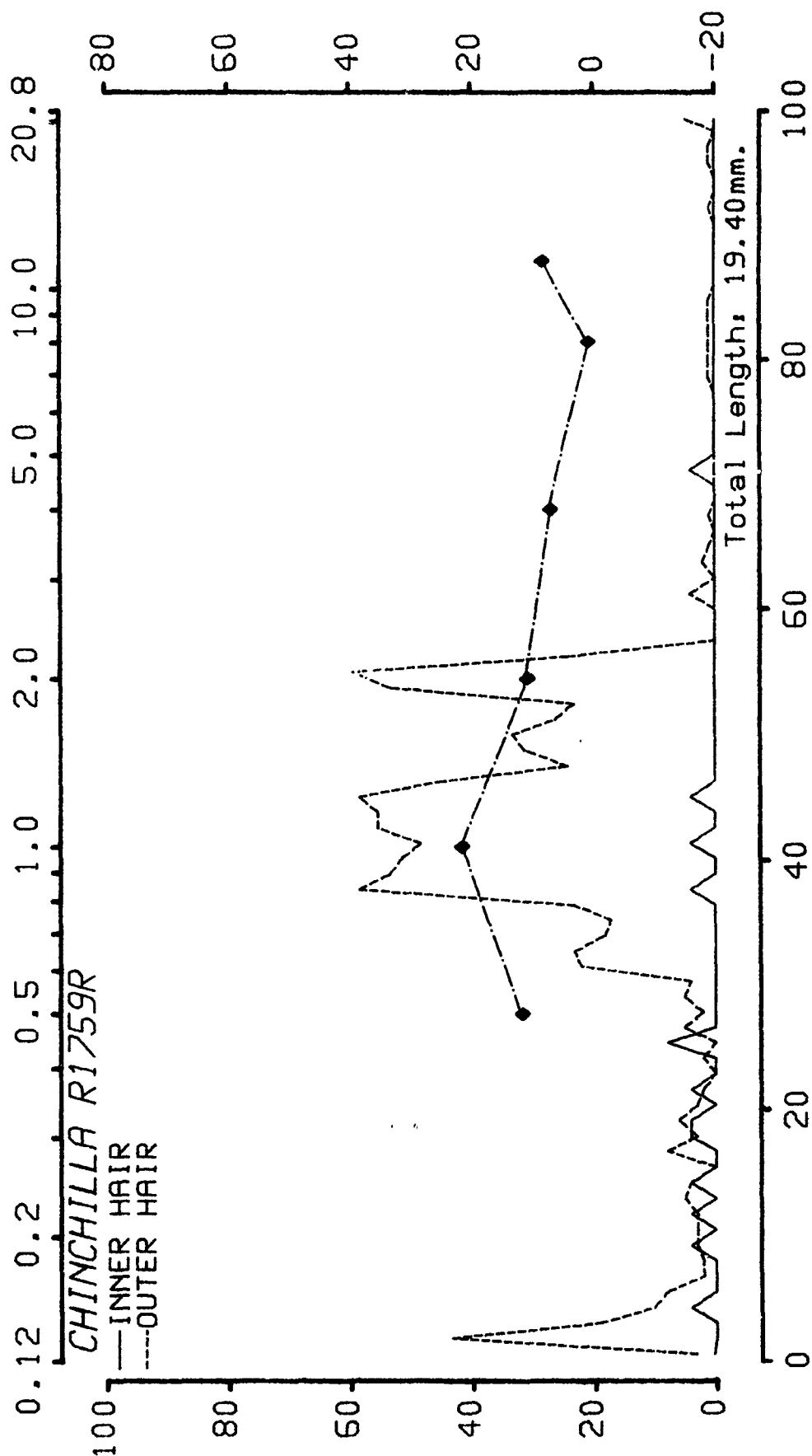
FREQUENCY (KHZ)



% TOTAL DISTANCE FROM APEX

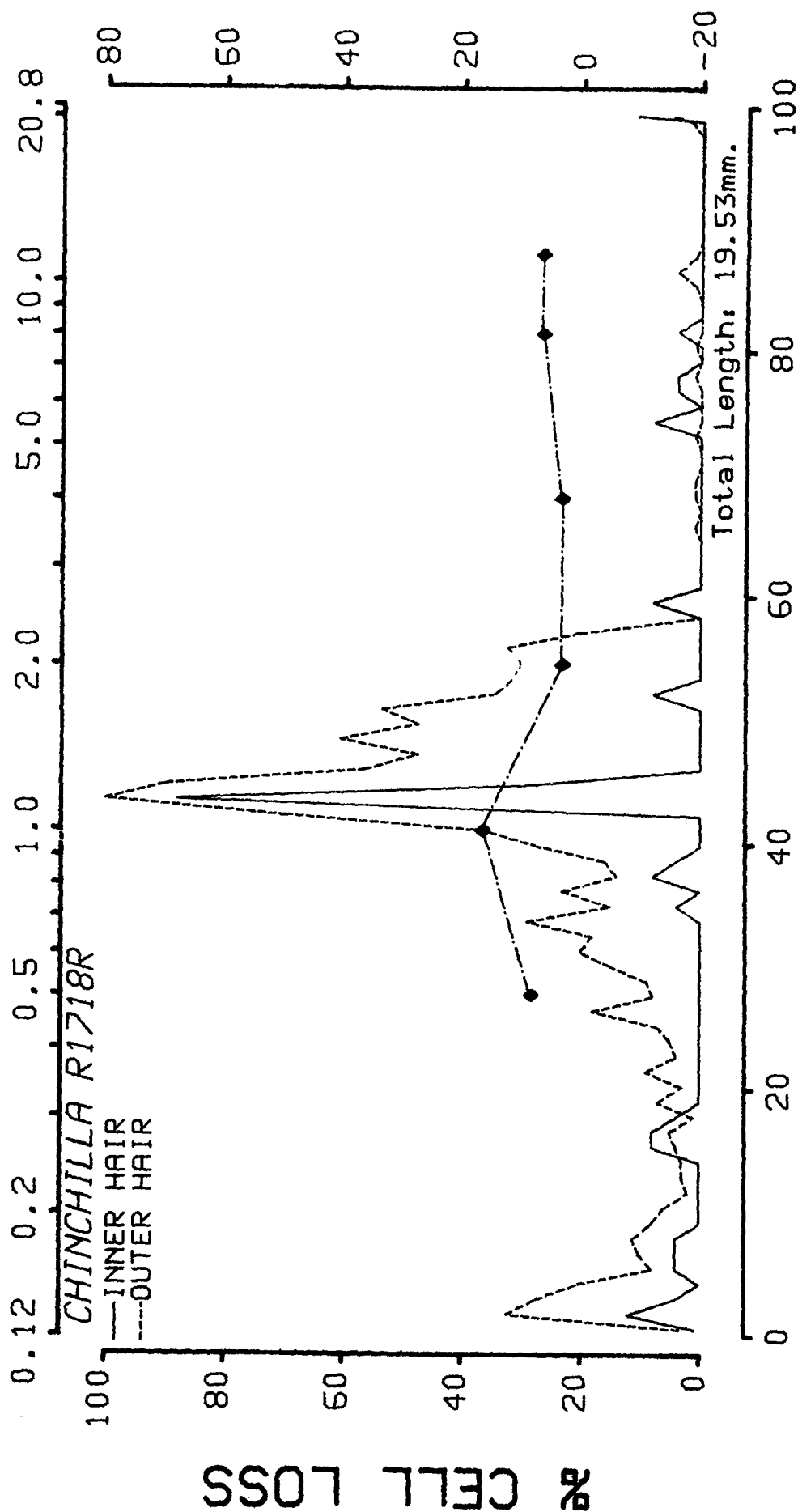


FREQUENCY (kHz)



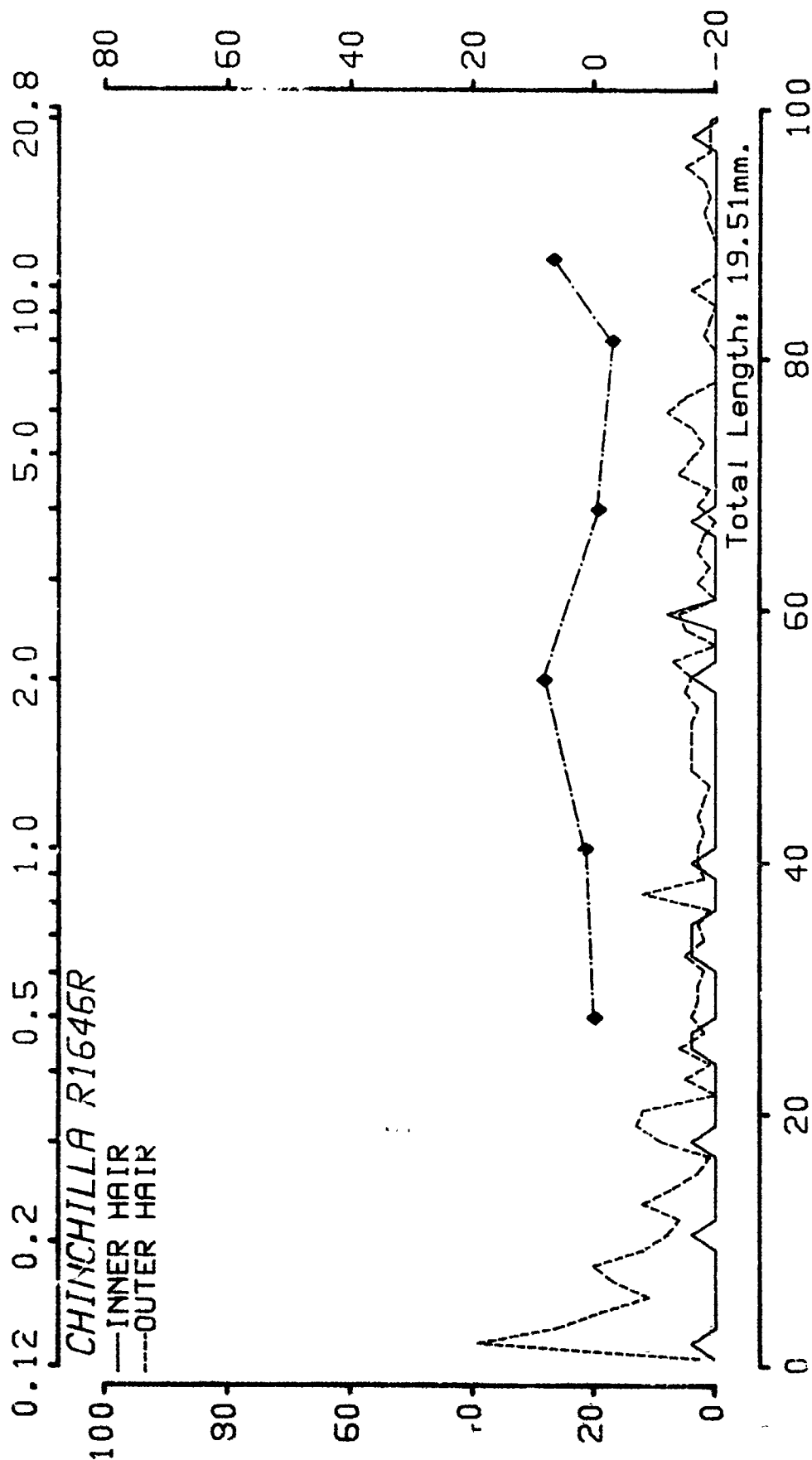
% TOTAL DISTANCE FROM APEX

FREQUENCY (kHz)



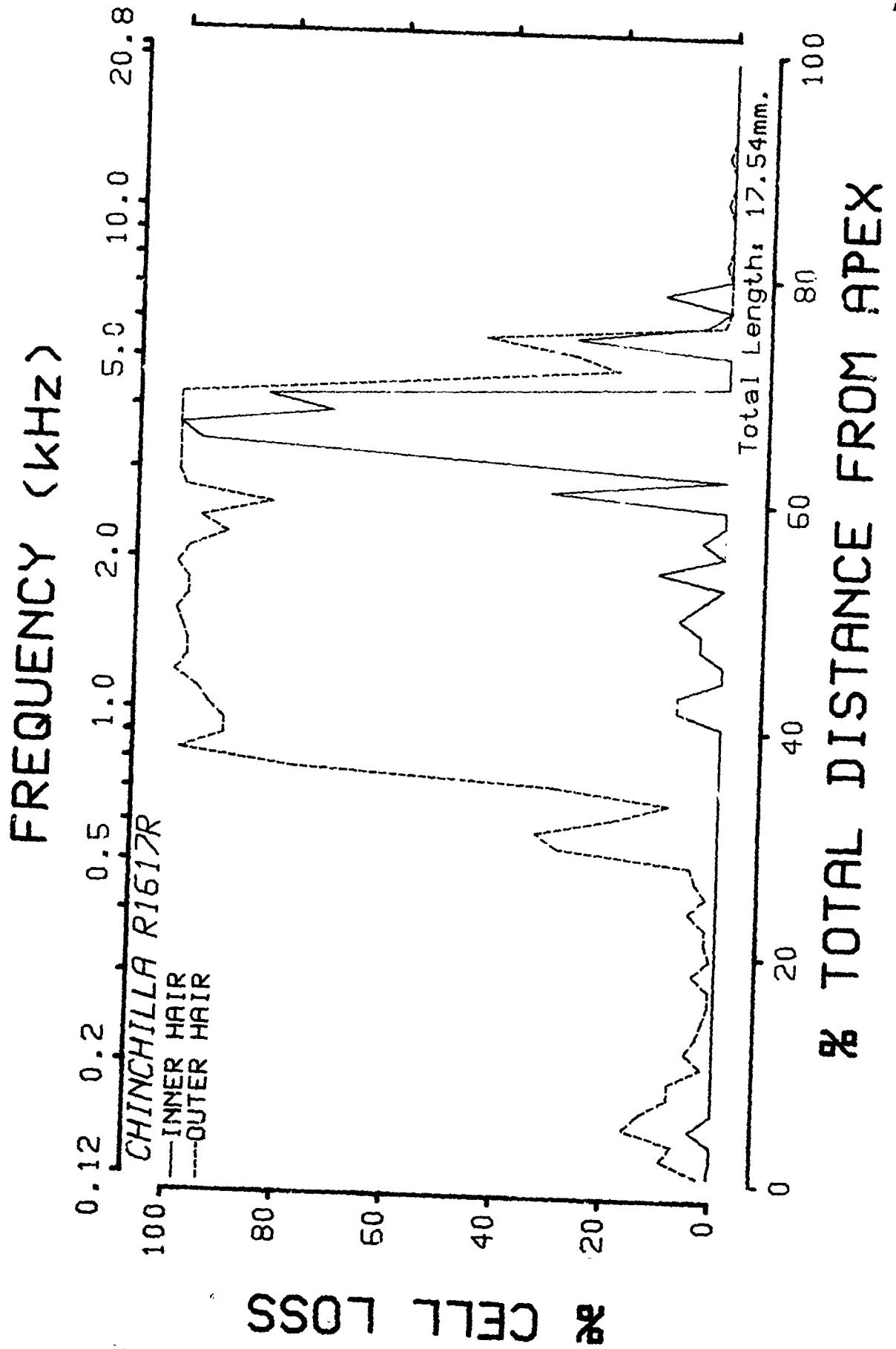
% TOTAL DISTANCE FROM APEX

FREQUENCY (KHz)



% TOTAL DISTANCE FROM APEX

% CELL LOSS



Summary Data for the Group Exposed to:

155 dB, 10X, 1/M

Animal

| | | |
|------|---|-------------------------------|
| 1102 | - | Completed the Entire Protocol |
| 1271 | - | Completed the Entire Protocol |
| 1272 | - | Completed the Entire Protocol |
| 1280 | - | Completed the Entire Protocol |
| 1293 | - | Completed the Entire Protocol |

155 cB 10X 1/M

PRE-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|-----|------|------|-------|
| 1102 | 15.3 | 11.7 | 6.7 | 6.7 | 19.7 | 22.0 | ***** |
| 1271 | 21.3 | 20.0 | 20.7 | 7.3 | 20.3 | 26.7 | ***** |
| 1272 | 21.3 | 10.0 | 15.7 | 5.7 | 17.0 | 20.0 | ***** |
| 1280 | 21.3 | 10.0 | 17.3 | 5.7 | 18.7 | 41.7 | ***** |
| 1293 | 19.5 | 17.5 | 16.8 | 6.8 | 25.5 | 20.8 | ***** |
| Mean | 19.8 | 13.8 | 15.4 | 6.4 | 20.2 | 26.2 | ***** |
| S.D. | 2.6 | 4.6 | 5.2 | 0.7 | 3.2 | 9.0 | ***** |

POST-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1102 | 23.7 | 20.0 | 21.7 | 11.7 | 31.3 | 23.7 | ***** |
| 1271 | 26.3 | 20.0 | 19.0 | 25.3 | 35.8 | 25.0 | ***** |
| 1272 | 31.3 | 38.3 | 37.3 | 9.0 | 20.3 | 30.0 | ***** |
| 1280 | 20.8 | 10.8 | 10.8 | 10.8 | 15.8 | 36.7 | ***** |
| 1293 | 44.2 | 44.2 | 40.8 | 24.2 | 22.5 | 24.2 | ***** |
| Mean | 29.3 | 26.7 | 25.9 | 16.2 | 25.1 | 27.9 | ***** |
| S.D. | 9.2 | 14.0 | 12.7 | 7.8 | 8.2 | 5.5 | ***** |

PERMANENT THRESHOLD SHIFT (dB)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1102 | 8.3 | 6.3 | 15.0 | 5.0 | 11.7 | 1.7 | ***** |
| 1271 | 5.0 | 0.0 | -1.7 | 17.9 | 15.4 | -1.7 | ***** |
| 1272 | 10.0 | 28.3 | 21.7 | 3.3 | 3.3 | 10.0 | ***** |
| 1280 | -0.5 | 0.8 | -6.5 | 5.2 | -2.8 | -5.0 | ***** |
| 1293 | 24.7 | 26.7 | 24.0 | 17.3 | -3.0 | 3.3 | ***** |
| Mean | 9.5 | 12.8 | 10.5 | 9.8 | 4.9 | 1.7 | ***** |
| S.D. | 9.4 | 13.8 | 13.8 | 7.2 | 8.4 | 5.7 | ***** |

155 dB 10X 1/M

TEMPORARY THRESHOLD SHIFT (dB)

| | | Frequency 0.5 kHz | | | | |
|-----------|------|-------------------|------|-------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1102 | 21.7 | 51.7 | 51.7 | 36.7 | 21.7 | 51.7 |
| 1271 | 6.7 | 21.7 | 21.7 | 1.7 | 21.7 | 21.7 |
| 1272 | 11.7 | 11.7 | 11.7 | 11.7 | -3.3 | 11.7 |
| 1280 | 21.7 | 11.7 | 1.7 | 1.7 | -3.3 | 21.7 |
| 1293 | 48.0 | 71.5* | 63.0 | 70.5* | 23.0 | 71.5 |
| Mean | 21.9 | 33.6 | 29.9 | 24.4 | 11.9 | 35.6 |
| S.D. | 15.9 | 26.8 | 26.3 | 29.5 | 13.9 | 25.0 |

| | | Frequency 2.0 kHz | | | | |
|-----------|------|-------------------|-------|------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1102 | 53.3 | 58.3 | 43.3 | 33.3 | 18.3 | 58.3 |
| 1271 | 3.3 | 18.3 | 23.3 | 18.3 | 13.3 | 23.3 |
| 1272 | 38.3 | 73.3 | 38.3 | 50.3 | -1.7 | 73.3 |
| 1280 | 41.7 | 46.7 | 11.7 | 11.7 | -3.3 | 46.7 |
| 1293 | 50.7 | 70.7 | 73.2* | 60.7 | 25.7 | 73.2 |
| Mean | 37.5 | 53.5 | 38.0 | 36.5 | 10.5 | 55.0 |
| S.D. | 20.1 | 22.3 | 23.3 | 22.5 | 12.6 | 20.9 |

| | | Frequency 8.0 kHz | | | | |
|-----------|------|-------------------|------|------|-------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1102 | 28.3 | 53.3 | 18.3 | 13.3 | 8.3 | 53.3 |
| 1271 | 11.7 | 21.7 | 26.7 | 31.7 | 16.7 | 31.7 |
| 1272 | 45.0 | 45.0 | 50.0 | 45.0 | 5.0 | 50.0 |
| 1280 | 48.3 | 38.3 | 28.3 | 3.3 | -11.7 | 48.3 |
| 1293 | 37.0 | 67.0 | 42.0 | 17.0 | -8.0 | 67.0 |
| Mean | 34.1 | 45.1 | 33.1 | 22.1 | 2.1 | 50.1 |
| S.D. | 14.7 | 16.9 | 12.7 | 16.4 | 11.7 | 12.6 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 1/M

Probe Frequency: 0.5 kHz

Masker (kHz): 0.150 0.200 0.300 0.400 0.520 0.600 0.650 0.750 1.300 2.200

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|-------|-------|
| 1102 (1.52) | 47.0 | 42.0 | 27.0 | 21.0 | 18.0 | 16.0 | 23.0 | 23.0 | 44.0 | 56.0 |
| 1271 (1.16) | 54.0 | 48.0 | 27.0 | 22.0 | 24.0 | 31.0 | 34.0 | 44.0 | 59.0 | 63.0 |
| 1272 (0.81) | 54.0 | 48.0 | 27.0 | 27.0 | 34.0 | 31.0 | 49.0 | 64.0 | 79.0 | 96.0* |
| 1280 (2.06) | 64.0 | 58.0 | 47.0 | 37.0 | 29.0 | 31.0 | 44.0 | 49.0 | 92.0* | 96.0* |
| 1293 (2.06) | 62.5 | 57.5 | 37.5 | 27.5 | 22.5 | 32.5 | 37.5 | 37.5 | 57.5 | 80.0* |

Mean
S.D.

| | | | | | | | | | | |
|---------|------|------|------|------|------|------|------|------|------|------|
| (1.52) | 56.3 | 50.7 | 33.1 | 26.9 | 25.5 | 28.3 | 37.5 | 44.5 | 66.3 | 78.2 |
| (0.55) | 7.0 | 6.9 | 9.0 | 6.3 | 6.2 | 6.9 | 10.0 | 13.4 | 19.0 | 18.4 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|-------|
| 1102 (2.75) | 62.0 | 62.0 | 47.0 | 36.0 | 23.0 | 31.0 | 38.0 | 48.0 | 59.0 | 81.0 |
| 1271 (2.97) | 64.0 | 58.0 | 42.0 | 32.0 | 29.0 | 21.0 | 34.0 | 39.0 | 69.0 | 88.0 |
| 1272 (1.75) | 69.0 | 68.0 | 47.0 | 47.0 | 39.0 | 51.0 | 59.0 | 59.0 | 79.0 | 96.0* |
| 1280 (1.12) | 67.5 | 57.5 | 42.5 | 42.5 | 27.5 | 32.5 | 32.5 | 32.5 | 47.5 | 96.0* |
| 1293 (1.28) | 57.5 | 62.5 | 52.5 | 52.5 | 47.5 | 52.5 | 57.5 | 52.5 | 92.5 | 92.5 |

Mean
S.D.

| | | | | | | | | | | |
|---------|------|------|------|------|------|------|------|------|------|------|
| (1.98) | 64.0 | 61.6 | 46.2 | 42.0 | 33.2 | 37.6 | 44.2 | 46.2 | 69.4 | 90.7 |
| (0.84) | 4.6 | 4.2 | 4.3 | 8.2 | 9.9 | 13.7 | 13.0 | 10.6 | 17.4 | 6.3 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 1/M

Probe Frequency: 1.0 kHz

Masker (kHz): 0.150 0.200 0.400 0.550 0.800 1.050 1.300 1.700 1.900 2.500

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|-------|------|------|------|------|------|------|------|------|-------|
| 1102 (1.96) | 77.0 | 72.0 | 61.0 | 48.0 | 38.0 | 24.0 | 29.0 | 47.0 | 57.0 | 76.0 |
| 1271 (1.50) | 49.0 | 38.0 | 37.0 | 33.0 | 23.0 | 32.0 | 39.0 | 62.0 | 60.0 | 61.0 |
| 1272 (0.66) | 44.0 | 33.0 | 27.0 | 23.0 | 13.0 | 17.0 | 19.0 | 22.0 | 25.0 | 36.0 |
| 1280 (1.13) | 92.0* | 73.0 | 52.0 | 38.0 | 28.0 | 32.0 | 39.0 | 52.0 | 60.0 | 94.0* |
| 1293 (1.65) | 72.5 | 72.5 | 57.5 | 42.5 | 32.5 | 27.5 | 37.5 | 52.5 | 57.5 | 80.0* |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (1.38) | 66.9 | 57.7 | 46.9 | 36.9 | 26.9 | 26.5 | 32.7 | 47.1 | 51.9 | 69.4 |
| S.D. (0.50) | 20.1 | 20.3 | 14.4 | 9.5 | 9.5 | 6.3 | 8.7 | 15.0 | 15.1 | 22.1 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|-------|------|-------|
| 1102 (2.01) | 67.0 | 62.0 | 56.0 | 48.0 | 33.0 | 29.0 | 44.0 | 67.0 | 67.0 | 76.0 |
| 1271 (1.58) | 74.0 | 68.0 | 52.0 | 43.0 | 23.0 | 27.0 | 39.0 | 52.0 | 55.0 | 81.0 |
| 1272 (1.47) | 74.0 | 73.0 | 67.0 | 58.0 | 43.0 | 47.0 | 59.0 | 72.0 | 70.0 | 81.0 |
| 1280 (2.55) | 72.5 | 72.5 | 62.5 | 47.5 | 32.5 | 22.5 | 37.5 | 60.0* | 57.5 | 95.0* |
| 1293 (2.55) | 87.5 | 92.5 | 82.5 | 72.5 | 67.5 | 57.5 | 72.5 | 67.5 | 57.5 | 62.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (2.03) | 75.0 | 73.6 | 64.0 | 53.8 | 39.8 | 36.6 | 50.4 | 63.7 | 61.4 | 79.1 |
| S.D. (0.52) | 7.6 | 11.5 | 11.8 | 11.8 | 17.0 | 14.9 | 15.0 | 7.8 | 6.6 | 11.7 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 1/M

Probe Frequency: 2.0 kHz

| Masker (kHz): | 0.300 | 0.750 | 0.900 | 1.300 | 1.700 | 2.050 | 2.200 | 3.000 | 3.500 | 4.000 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1102 (3.45) | 62.0 | 48.0 | 34.0 | 29.0 | 17.0 | 11.0 | 26.0 | 26.0 | 39.0 | 46.0 |
| 1271 (3.23) | 57.0 | 54.0 | 43.0 | 44.0 | 17.0 | 25.0 | 43.0 | 50.0 | 61.0 | 67.0 |
| 1272 (1.28) | 42.0 | 39.0 | 28.0 | 34.0 | 27.0 | 30.0 | 48.0 | 75.0 | 94.0* | 90.0* |
| 1280 (5.41) | 62.0 | 49.0 | 43.0 | 54.0 | 37.0 | 25.0 | 43.0 | 50.0 | 71.0 | 90.0* |
| 1293 (7.98) | 67.5 | 42.5 | 37.5 | 37.5 | 32.5 | 12.5 | 32.5 | 42.5 | 52.5 | 62.5 |
| Mean (4.27) | 58.1 | 46.5 | 37.1 | 39.7 | 26.1 | 20.7 | 38.5 | 48.7 | 63.5 | 71.1 |
| S.D. (2.54) | 9.7 | 5.9 | 6.4 | 9.7 | 9.0 | 8.4 | 9.0 | 17.7 | 20.7 | 18.9 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1102 (4.89) | 62.0 | 58.0 | 49.0 | 44.0 | 37.0 | 26.0 | 41.0 | 41.0 | 54.0 | 56.0 |
| 1271 (6.25) | 52.0 | 49.0 | 43.0 | 39.0 | 37.0 | 20.0 | 33.0 | 40.0 | 51.0 | 90.0* |
| 1272 (2.99) | 62.0 | 64.0 | 63.0 | 74.0 | 52.0 | 60.0 | 73.0 | 93.0* | 94.0* | 90.0* |
| 1280 (6.14) | 67.5 | 42.5 | 37.5 | 32.5 | 32.5 | 12.5 | 22.5 | 42.5 | 42.5 | 62.5 |
| 1293 (3.72) | 77.5 | 57.5 | 62.5 | 65.0 | 70.0 | 52.5 | 62.5 | 55.0 | 47.5 | 80.0* |
| Mean (4.80) | 64.2 | 54.2 | 51.0 | 50.9 | 45.7 | 34.2 | 46.4 | 54.3 | 57.8 | 75.7 |
| S.D. (1.44) | 9.3 | 8.4 | 11.5 | 17.7 | 15.5 | 20.9 | 20.9 | 22.5 | 20.7 | 15.7 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 1/M

Probe Frequency: 4.0 kHz

| Masker (kHz): | 0.450 | 1.300 | 2.200 | 3.000 | 3.500 | 4.100 | 4.500 | 5.000 | 5.600 | 6.000 |
|------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1102 (5.12) | 78.0 | 64.0 | 56.0 | 46.0 | 34.0 | 15.0 | 23.0 | 36.0 | 43.0 | 67.0 |
| 1271 (2.00) | 73.0 | 54.0 | 48.0 | 40.0 | 36.0 | 45.0 | 58.0 | 58.0 | 59.0 | 72.0 |
| 1272 (1.28) | 43.0 | 39.0 | 23.0 | 20.0 | 21.0 | 30.0 | 38.0 | 38.0 | 49.0 | 47.0 |
| 1280 (2.99) | 73.0 | 54.0 | 68.0 | 50.0 | 31.0 | 35.0 | 43.0 | 48.0 | 74.0 | 90.0* |
| 1293 (4.76) | 47.5 | 42.5 | 47.5 | 42.5 | 27.5 | 17.5 | 32.5 | 60.0* | 75.0 | 77.5 |
| Mean (3.23) | 62.9 | 50.7 | 48.5 | 39.7 | 29.9 | 28.5 | 38.9 | 48.0 | 60.0 | 70.7 |
| S.D. (1.68) | 16.3 | 10.0 | 16.5 | 11.6 | 5.9 | 12.4 | 13.0 | 11.0 | 14.4 | 15.8 |

| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
|------------------|---------------|------|------|------|------|------|------|------|------|-------|
| 1102 (4.83) | 78.0 | 59.0 | 61.0 | 46.0 | 29.0 | 20.0 | 38.0 | 46.0 | 53.0 | 67.0 |
| 1271 (2.14) | 78.0 | 74.0 | 83.0 | 60.0 | 51.0 | 55.0 | 58.0 | 73.0 | 79.0 | 90.0* |
| 1272 (2.46) | 78.0 | 59.0 | 63.0 | 35.0 | 31.0 | 40.0 | 43.0 | 38.0 | 44.0 | 57.0 |
| 1280 (3.53) | 72.5 | 57.5 | 47.5 | 47.5 | 32.5 | 22.5 | 27.5 | 42.5 | 52.5 | 67.5 |
| 1293 (2.73) | 67.5 | 52.5 | 52.5 | 47.5 | 42.5 | 32.5 | 32.5 | 42.5 | 47.5 | 47.5 |
| Mean (3.14) | 74.8 | 60.4 | 61.4 | 47.2 | 37.2 | 34.0 | 39.8 | 48.4 | 55.2 | 65.8 |
| S.D. (1.08) | 4.7 | 8.1 | 13.6 | 8.9 | 9.3 | 14.2 | 11.7 | 14.0 | 13.8 | 15.8 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 1/M

Probe Frequency: 8.0 kHz

| Masker (kHz): | 0.450 | 1.300 | 2.500 | 5.900 | 7.000 | 8.100 | 9.300 | 11.000 | 12.700 | 14.000 |
|------------------|--------------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1102 (4.85) | 73.0 | 59.0 | 56.0 | 38.0 | **** | 25.0 | 28.0 | 52.0 | 80.0 | 85.0* |
| 1271 (3.49) | 68.0 | 64.0 | 51.0 | 33.0 | 23.0 | 35.0 | 41.0 | 57.0 | 61.0 | 72.0 |
| 1272 (2.18) | 58.0 | 54.0 | 51.0 | 28.0 | 23.0 | 20.0 | 31.0 | 42.0 | 51.0 | 62.0 |
| 1280 (1.76) | 73.0 | 59.0 | 56.0 | 38.0 | 38.0 | 35.0 | 51.0 | 72.0 | 71.0 | 90.0* |
| 1293 (4.49) | 82.5 | 82.5 | 62.5 | 47.5 | 47.5 | 37.5 | 32.5 | 85.0* | 90.0* | 95.0* |
| Mean | (3.36) | 70.9 | 63.7 | 55.3 | 36.9 | 32.9 | 30.5 | 61.6 | 70.6 | 80.8 |
| S.D. | (1.37) | 8.9 | 11.1 | 4.7 | 7.2 | 12.0 | 7.6 | 17.0 | 15.3 | 13.6 |

| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
|------------------|---------------|------|------|------|------|------|------|-------|-------|--------|
| 1102 (5.67) | 63.0 | 59.0 | 56.0 | 38.0 | 37.0 | 25.0 | 48.0 | 67.0 | 70.0 | 85.0* |
| 1271 (1.89) | 68.0 | 64.0 | 66.0 | 43.0 | 48.0 | 40.0 | 56.0 | 77.0 | 76.0 | 90.0* |
| 1272 (3.92) | 53.0 | 29.0 | 36.0 | 33.0 | 23.0 | 15.0 | 31.0 | 57.0 | 51.0 | 57.0 |
| 1280 (1.35) | 72.5 | 62.5 | 62.5 | 37.5 | 37.5 | 37.5 | 62.5 | 75.0* | 95.0* | 100.0* |
| 1293 (3.52) | 72.5 | 67.5 | 62.5 | 42.5 | 47.5 | 37.5 | 47.5 | 62.5 | 67.5 | 82.5 |
| Mean | (3.27) | 65.8 | 56.4 | 56.6 | 38.8 | 38.6 | 31.0 | 67.7 | 71.9 | 82.9 |
| S.D. | (1.72) | 8.2 | 15.6 | 12.1 | 4.1 | 10.2 | 10.7 | 8.4 | 15.9 | 16.0 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 1/M

Probe Frequency: 11.2 kHz

Masker (kHz): 1.000 4.000 7.000 9.000 11.000 11.500 12.000 13.000 14.500 16.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|-------|------|------|------|------|------|------|-------|
| 1102 (14.94) | 69.0 | **** | 77.0 | 50.0 | 37.0 | 35.0 | 20.0 | 41.0 | 61.0 | 69.0 |
| 1271 (10.49) | 56.0 | **** | 48.0 | 44.0 | 42.0 | 27.0 | 29.0 | 59.0 | 62.0 | 71.0 |
| 1272 (16.84) | 81.0 | **** | 48.0 | 44.0 | 32.0 | 22.0 | 49.0 | 74.0 | 82.0 | 89.0* |
| 1280 (9.01) | 66.0 | **** | 68.0 | 69.0 | 62.0 | 42.0 | 44.0 | 59.0 | 82.0 | 89.0* |
| 1293 (4.93) | 77.5 | 52.5 | 70.0* | 67.5 | 42.5 | 42.5 | 37.5 | 47.5 | 67.5 | 90.0* |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (11.24) | 69.9 | 52.5 | 62.2 | 54.9 | 43.1 | 33.7 | 35.9 | 56.1 | 70.9 | 81.6 |
| S.D. (4.75) | 9.9 | **** | 13.4 | 12.4 | 11.4 | 9.1 | 11.6 | 12.6 | 10.4 | 10.6 |

Animal (Q-10 dB)

Post-Exposure

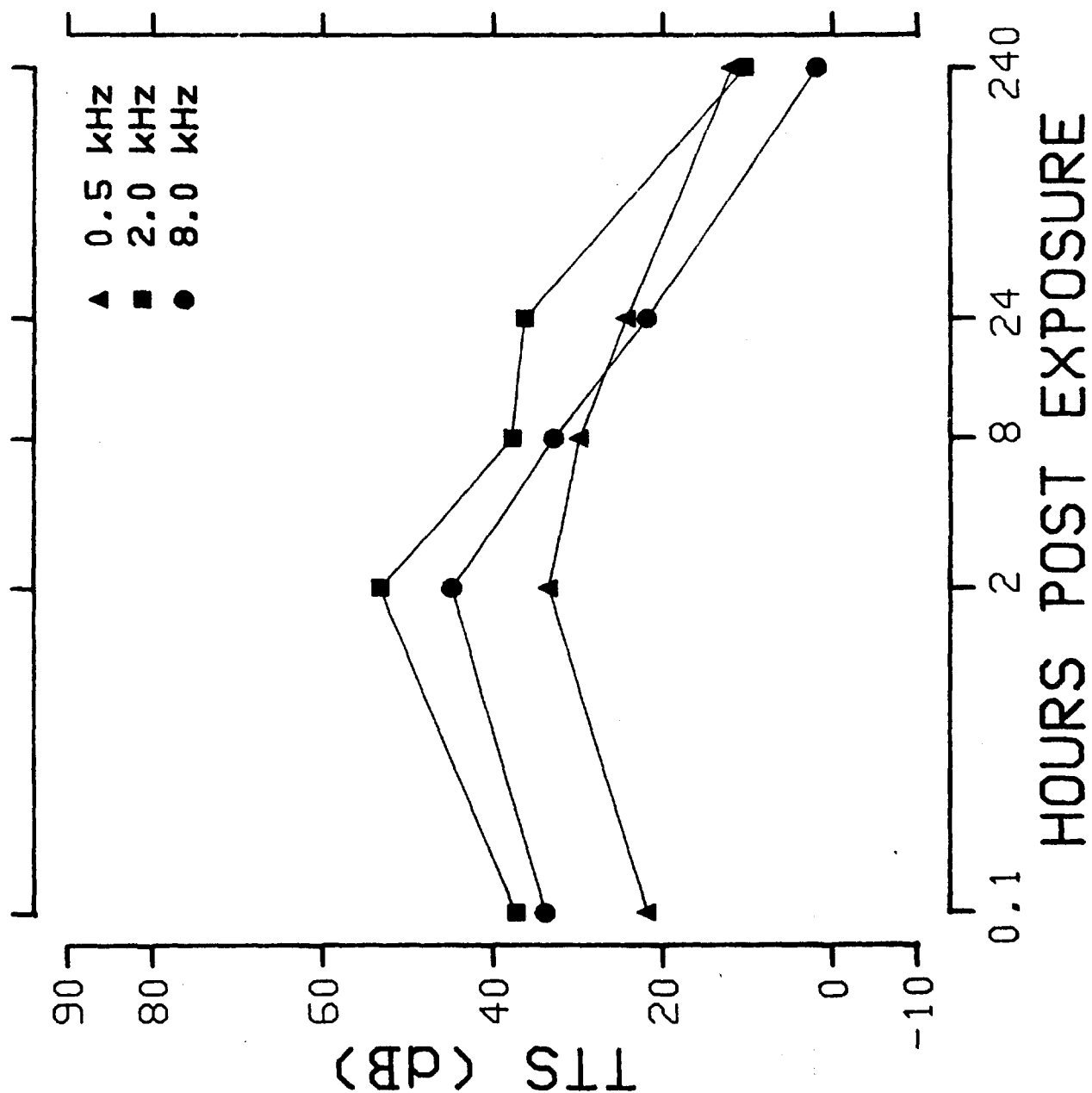
| | | | | | | | | | | |
|--------------|------|------|------|-------|-------|------|------|------|-------|--------|
| 1102 (10.74) | 84.0 | **** | 62.0 | 35.0 | 32.0 | 35.0 | 25.0 | 41.0 | 56.0 | 64.0 |
| 1271 (2.54) | 31.0 | **** | 28.0 | 29.0 | 22.0 | 37.0 | 39.0 | 44.0 | 47.0 | 41.0 |
| 1272 (5.11) | 76.0 | **** | 73.0 | 59.0 | 37.0 | 42.0 | 44.0 | 59.0 | 62.0 | 66.0 |
| 1280 (0.80) | 72.5 | 52.5 | 62.5 | 62.5 | 52.5 | 65.0 | 52.5 | 62.5 | 80.0* | 90.0* |
| 1293 (11.93) | 72.5 | 52.5 | 62.5 | 70.0* | 60.0* | 52.5 | 67.5 | 47.5 | 72.5 | 100.0* |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (6.22) | 67.2 | 52.5 | 57.6 | 51.1 | 40.7 | 46.3 | 45.6 | 50.8 | 63.5 | 72.2 |
| S.D. (4.93) | 20.8 | 0.0 | 17.2 | 18.0 | 15.4 | 12.5 | 15.8 | 9.5 | 13.1 | 23.3 |

The Group Mean Recovery Curves
Measured at Three Test Frequencies

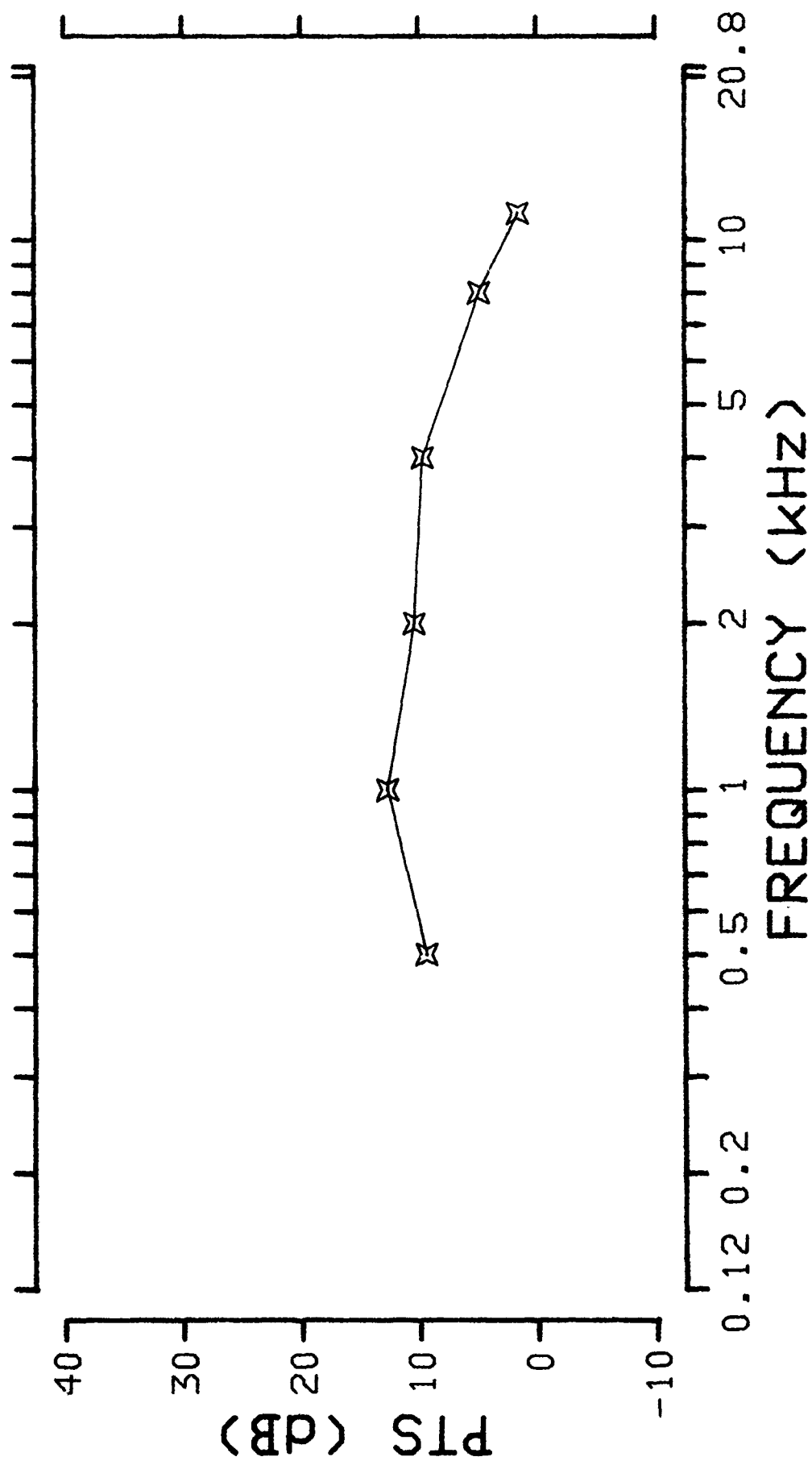
MEAN DATA (n=5) - 155 dB 10X 1/M

A183



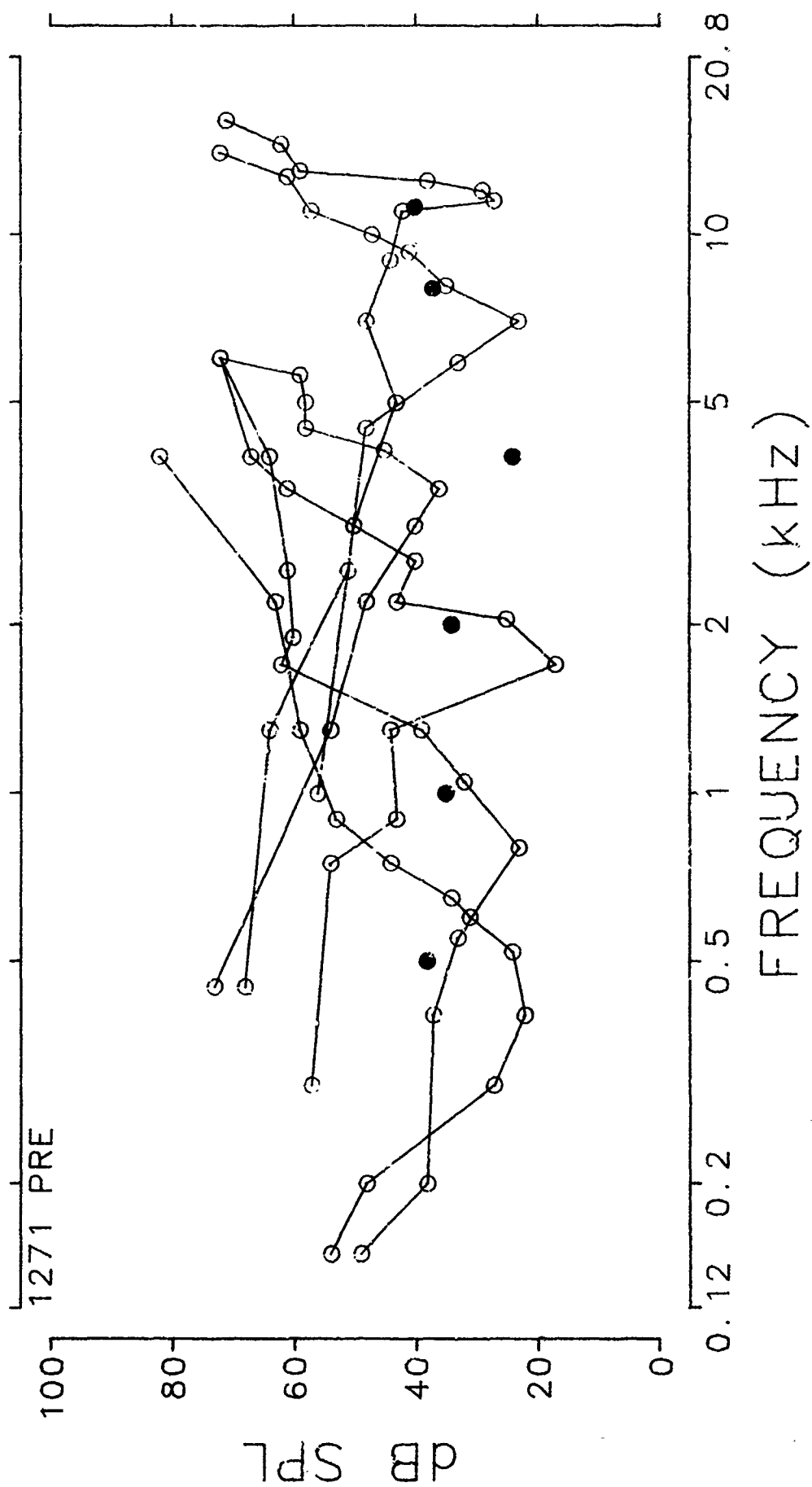
The Group Mean Permanent Threshold Shift (PTS)
for all Test Frequencies

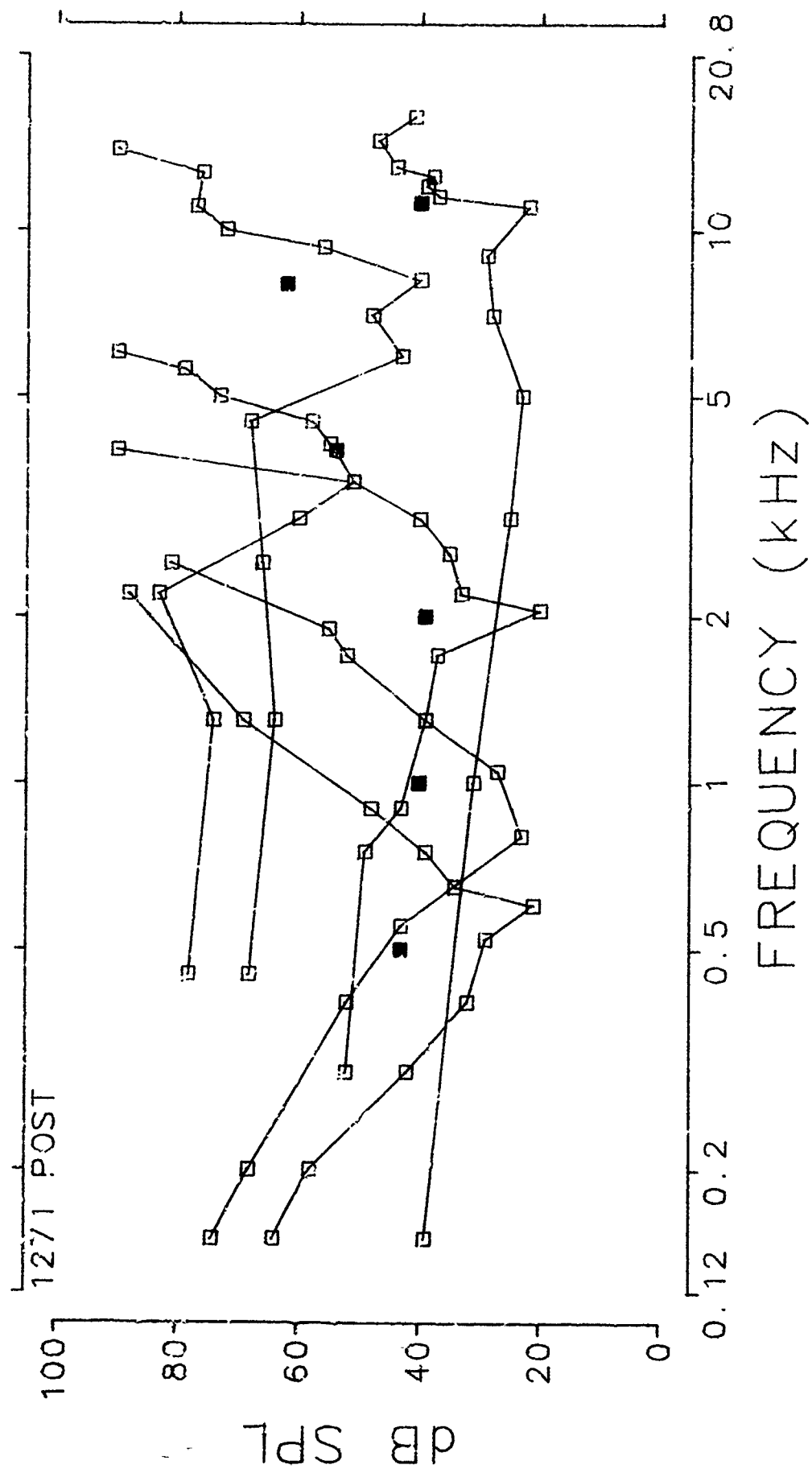
MEAN DATA (n=5) - 155 dB 10X 1/M

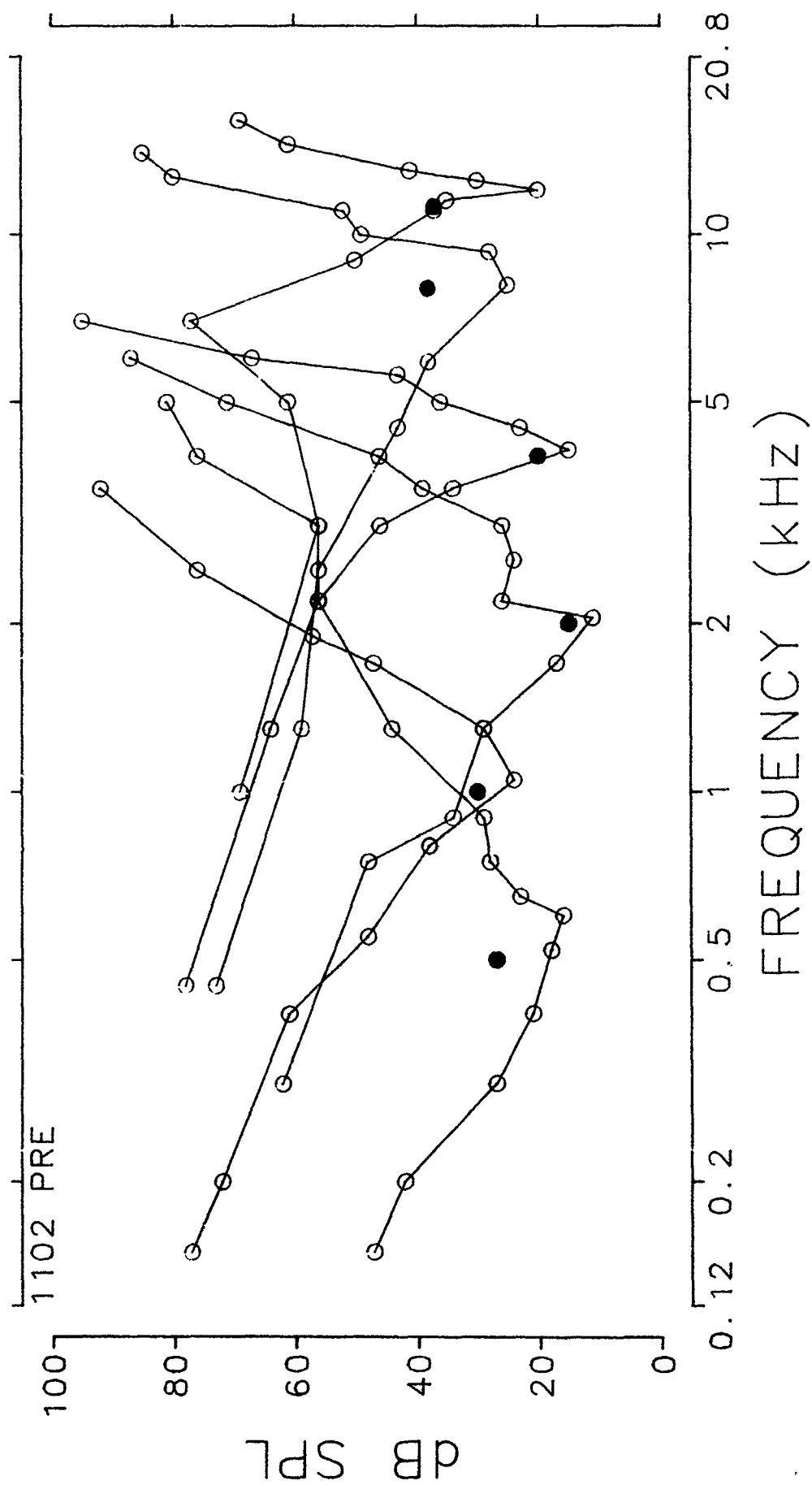


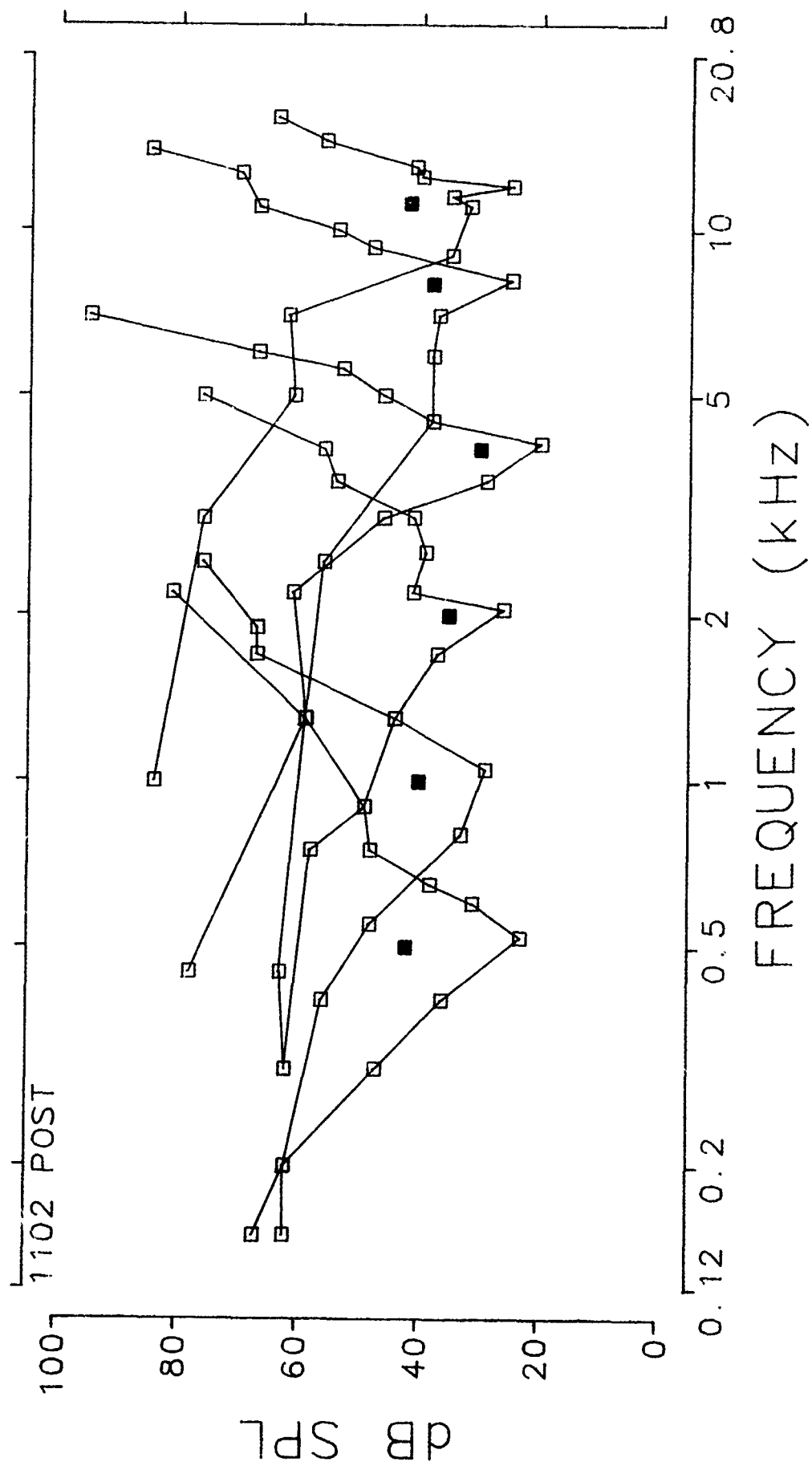
The Pre and Postexposure Tuning Curves for
Individual Animals in this Exposure Group.

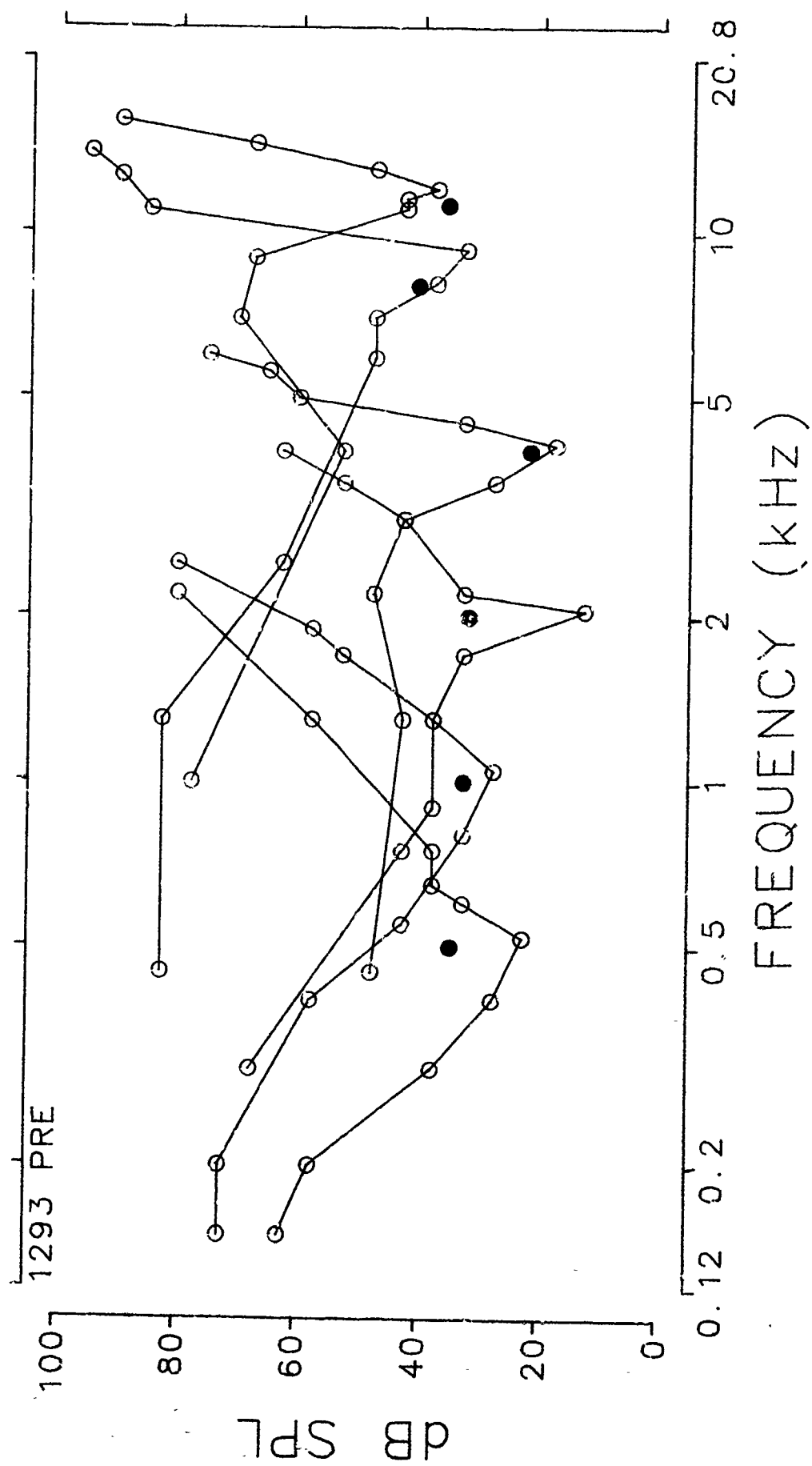
The solid symbol represents the threshold of the probe tone.

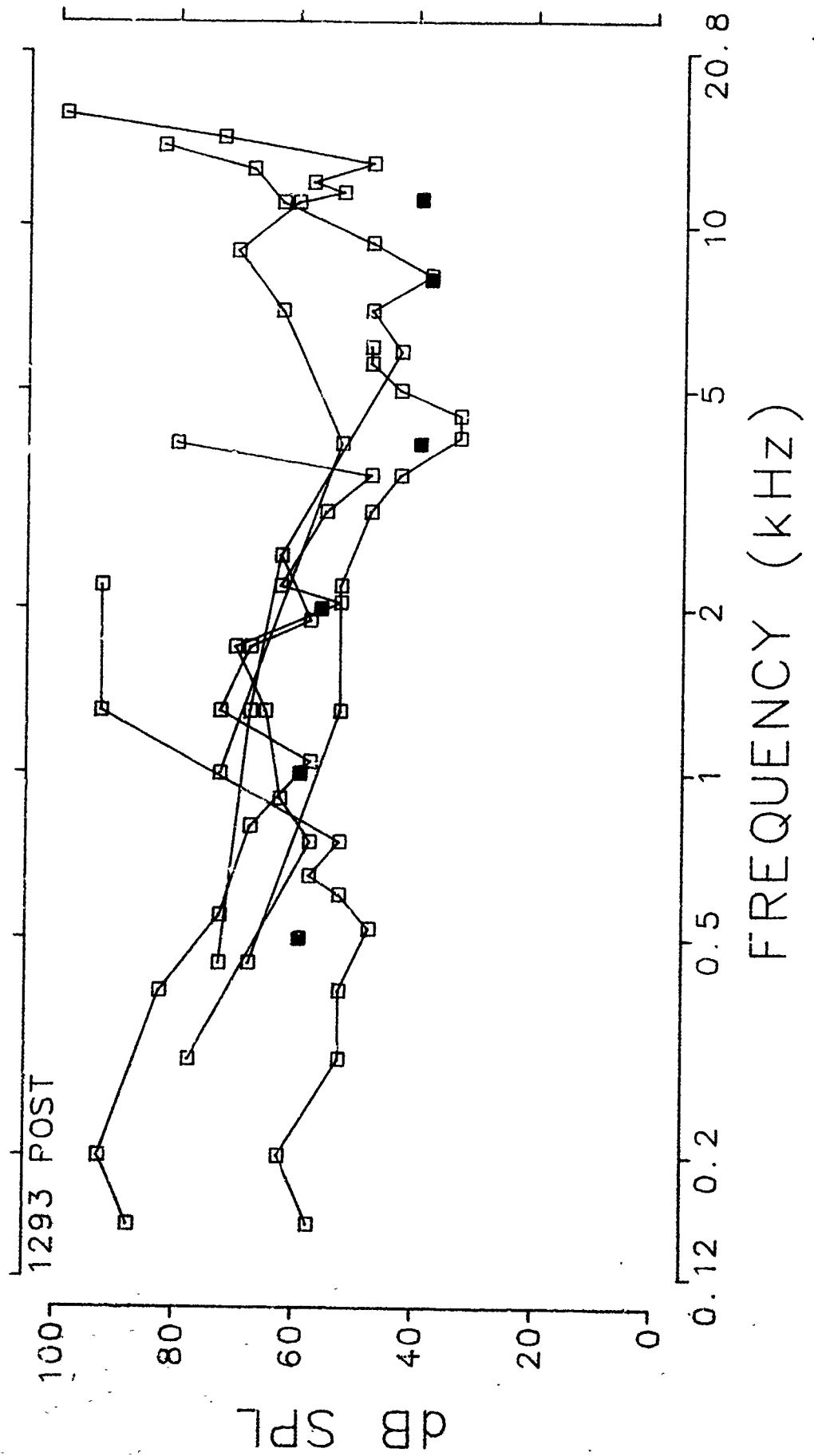


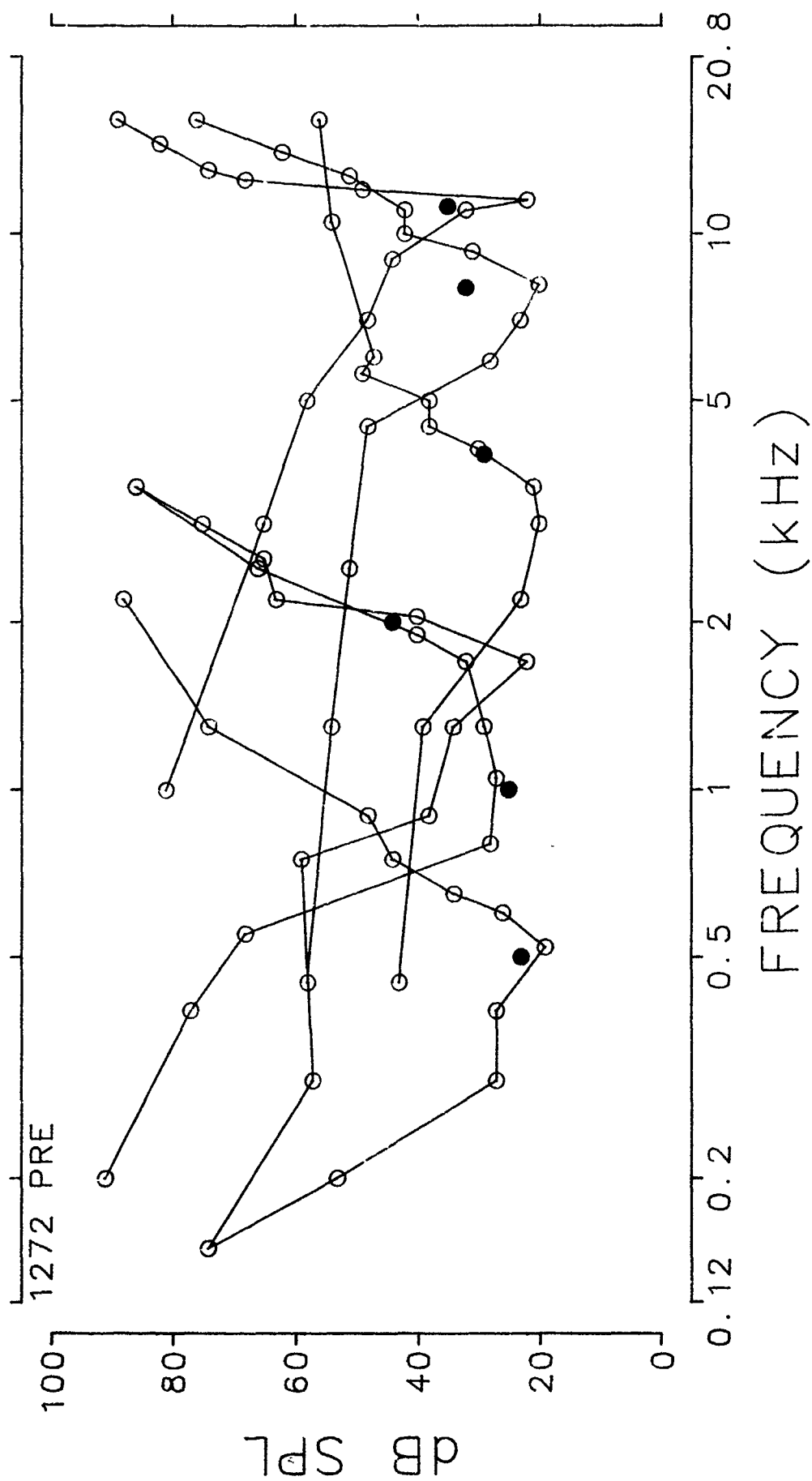


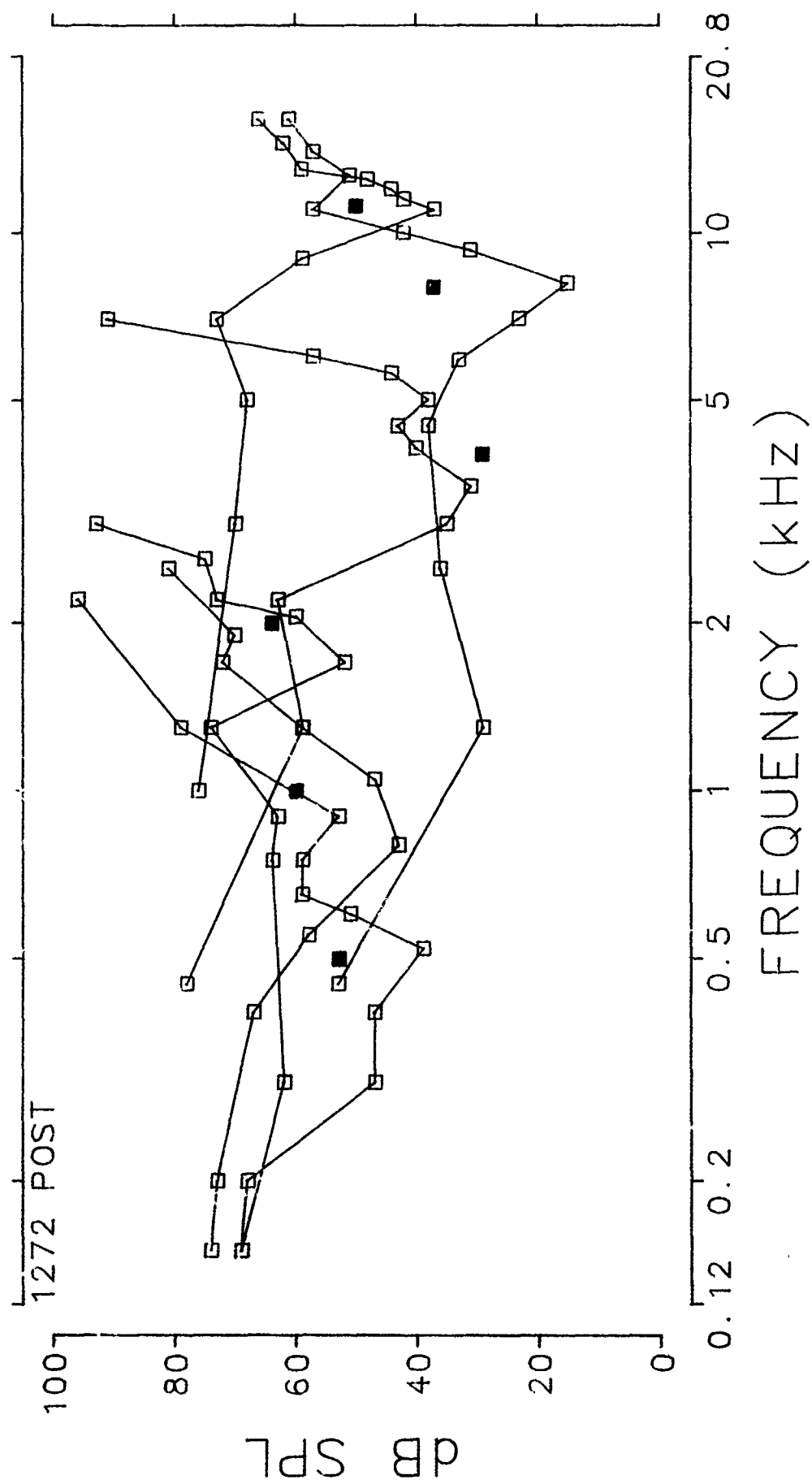


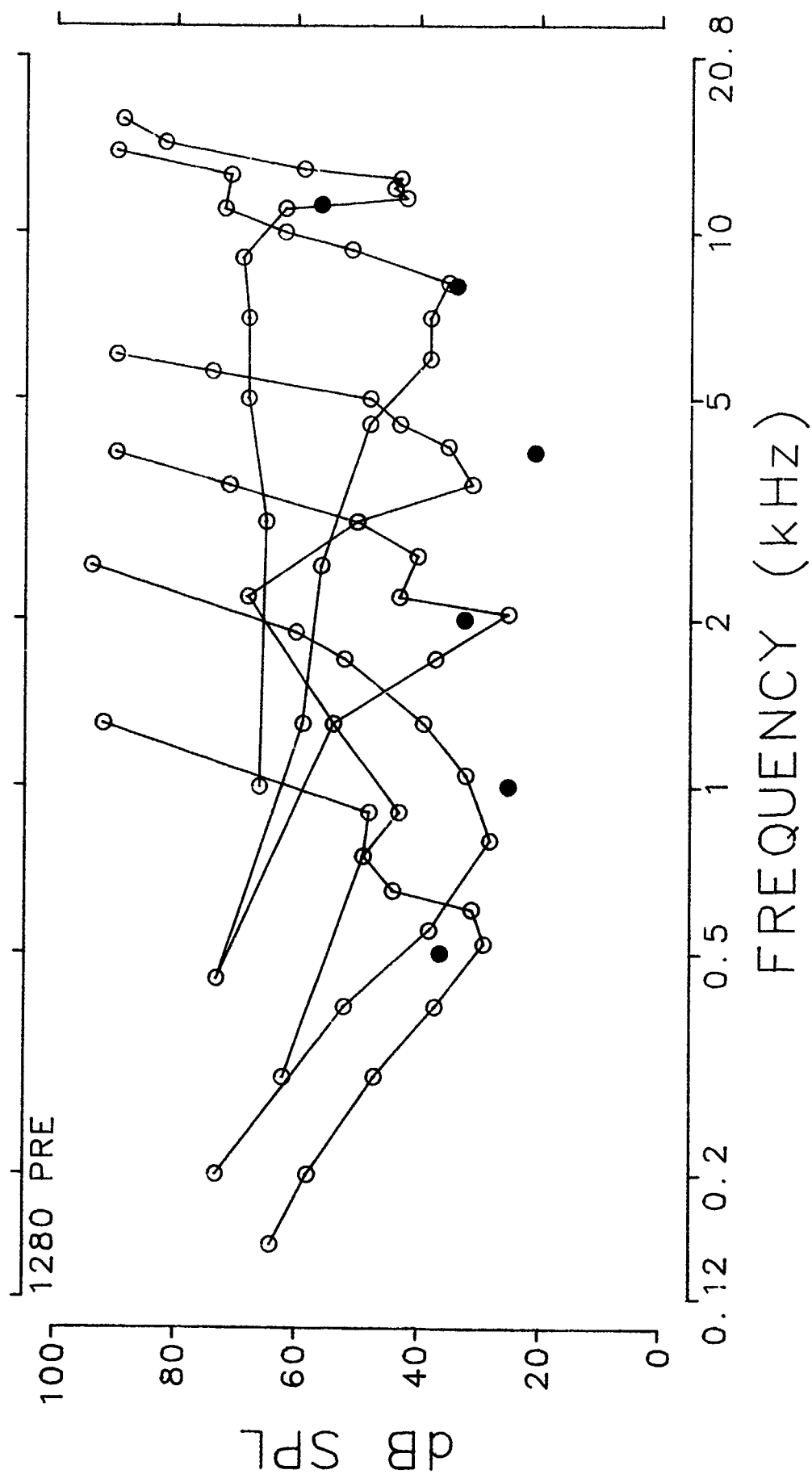


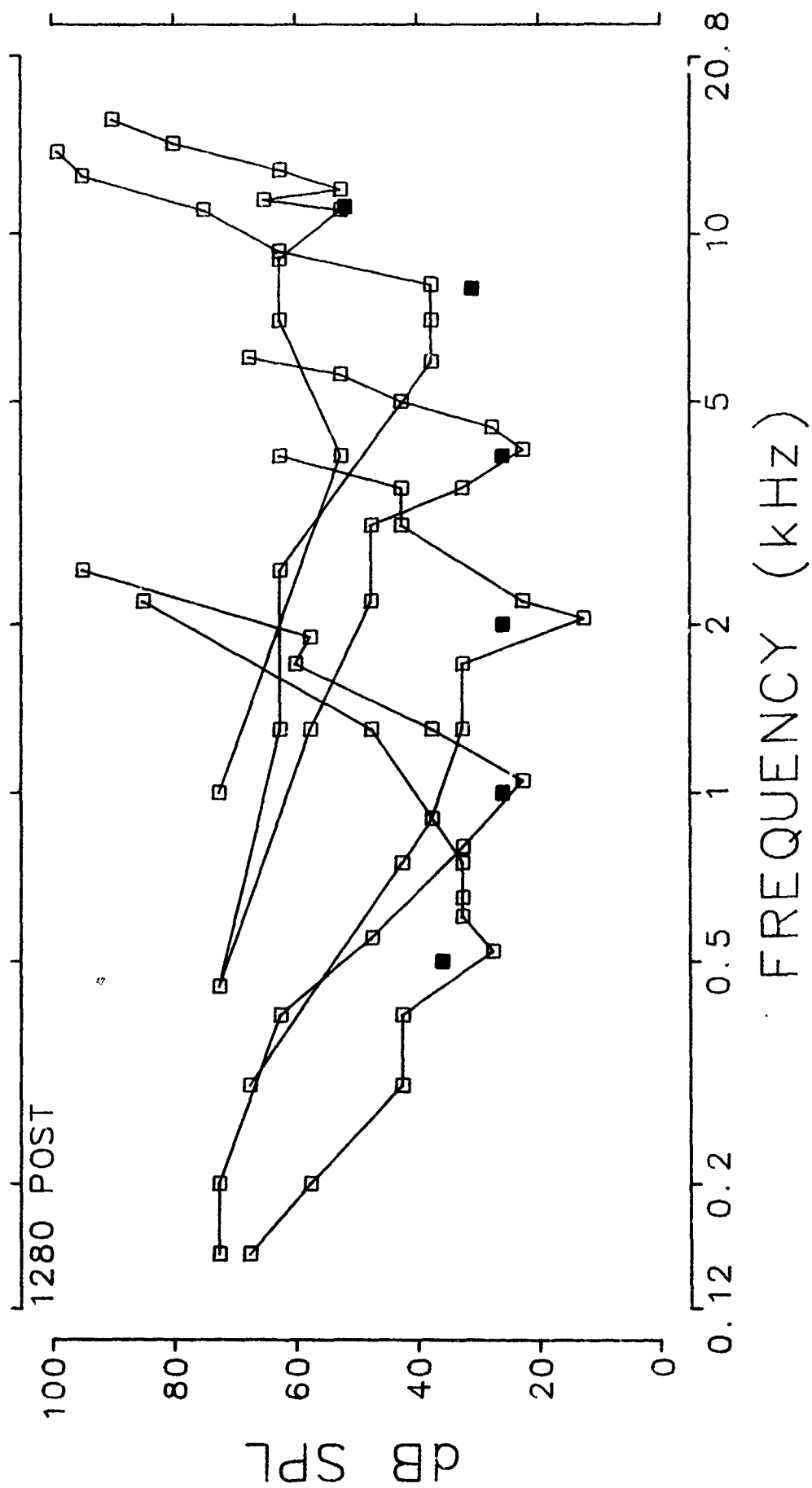












SHOCK TUBE EXPOSURE
155 dB, 10X, 1/MIN

TOTAL NUMBER OF COCHLEAR SENSORY CELLS MISSING

| ANIMAL NUMBER | INNER HAIR CELLS | 1ST ROW OUTER HAIR CELLS | 2ND ROW OUTER HAIR CELLS | 3RD ROW OUTER HAIR CELLS | TOTAL OUTER HAIR CELLS |
|------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------------------------|
| R1102R | 16 | 282 | 215 | 148 | 645 |
| R1271R | 14 | 170 | 127 | 220 | 517 |
| R1272R | 14 | 263 | 124 | 142 | 529 |
| R1280R | 5 | 63 | 81 | 112 | 256 |
| R1293R | 48 | 732 | 784 | 550 | 2066 |
| GROUP MEAN | 19 | | | | 803 |
| S.D. | 17 | | | | 720 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND LENGTHS OF THE
COCHLEA CENTERED AT THE FREQUENCIES INDICATED

| | OCTAVE BAND CENTER FREQUENCY | INNER HAIR CELLS | OUTER HAIR CELLS |
|-------------|------------------------------------|------------------------|------------------------|
| GROUP MEANS | | | |
| | 0.125 kHz | 1.6 | 43.4 |
| | 0.25 kHz | 2.0 | 53.6 |
| | 0.5 kHz | 1.4 | 72.6 |
| | 1 kHz | 3.0 | 277.8 |
| | 2 kHz | 3.2 | 218.4 |
| | 4 kHz | 4.6 | 67.6 |
| | 8 kHz | 1.8 | 28.8 |
| | 16 kHz | 1.8 | 27.0 |

STANDARD DEVIATIONS

| | | | |
|--|-----------|-----|-------|
| | 0.125 kHz | 1.5 | 26.2 |
| | 0.25 kHz | 1.6 | 23.6 |
| | 0.5 kHz | 1.5 | 45.7 |
| | 1 kHz | 4.1 | 332.8 |
| | 2 kHz | 4.5 | 281.7 |
| | 4 kHz | 7.8 | 67.2 |
| | 8 kHz | 1.3 | 26.9 |
| | 16 kHz | 2.2 | 34.7 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1102R | | | | | | | |
| 0.125 kHz | 3 | 7 | 10 | 25 | 42 | 0 | 0 |
| 0.25 kHz | 2 | 8 | 25 | 54 | 87 | 0 | 0 |
| 0.5 kHz | 4 | 26 | 32 | 26 | 84 | 0 | 0 |
| 1 kHz | 3 | 168 | 94 | 16 | 278 | 1 | 6 |
| 2 kHz | 3 | 68 | 46 | 18 | 132 | 1 | 3 |
| 4 kHz | 0 | 1 | 5 | 5 | 11 | 0 | 0 |
| 8 kHz | 1 | 2 | 2 | 3 | 7 | 0 | 0 |
| 16 kHz | 0 | 2 | 1 | 1 | 4 | 0 | 0 |
| TOTALS | 16 | 282 | 215 | 148 | 645 | 2 | 9 |

CHINCHILLA R1271R

| | | | | | | | |
|-----------|----|-----|-----|-----|-----|---|----|
| 0.125 kHz | 3 | 6 | 12 | 12 | 30 | 0 | 4 |
| 0.25 kHz | 3 | 9 | 14 | 15 | 38 | 1 | 0 |
| 0.5 kHz | 1 | 18 | 11 | 15 | 44 | 0 | 0 |
| 1 kHz | 1 | 16 | 13 | 23 | 52 | 0 | 1 |
| 2 kHz | 0 | 31 | 6 | 79 | 116 | 0 | 1 |
| 4 kHz | 0 | 31 | 24 | 30 | 85 | 1 | 4 |
| 8 kHz | 1 | 23 | 24 | 21 | 68 | 0 | 2 |
| 16 kHz | 5 | 36 | 23 | 25 | 84 | 0 | 1 |
| TOTALS | 14 | 170 | 127 | 220 | 517 | 2 | 13 |

CHINCHILLA R1272R

| | | | | | | | |
|-----------|----|-----|-----|-----|-----|---|---|
| 0.125 kHz | 0 | 2 | 6 | 19 | 27 | 0 | 0 |
| 0.25 kHz | 1 | 8 | 17 | 41 | 66 | 0 | 1 |
| 0.5 kHz | 1 | 28 | 19 | 31 | 78 | 0 | 0 |
| 1 kHz | 1 | 148 | 38 | 22 | 208 | 2 | 0 |
| 2 kHz | 2 | 31 | 16 | 6 | 53 | 0 | 1 |
| 4 kHz | 5 | 9 | 3 | 3 | 15 | 0 | 0 |
| 8 kHz | 1 | 5 | 1 | 1 | 7 | 0 | 0 |
| 16 kHz | 3 | 19 | 11 | 6 | 36 | 2 | 3 |
| TOTALS | 14 | 263 | 124 | 142 | 529 | 4 | 6 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

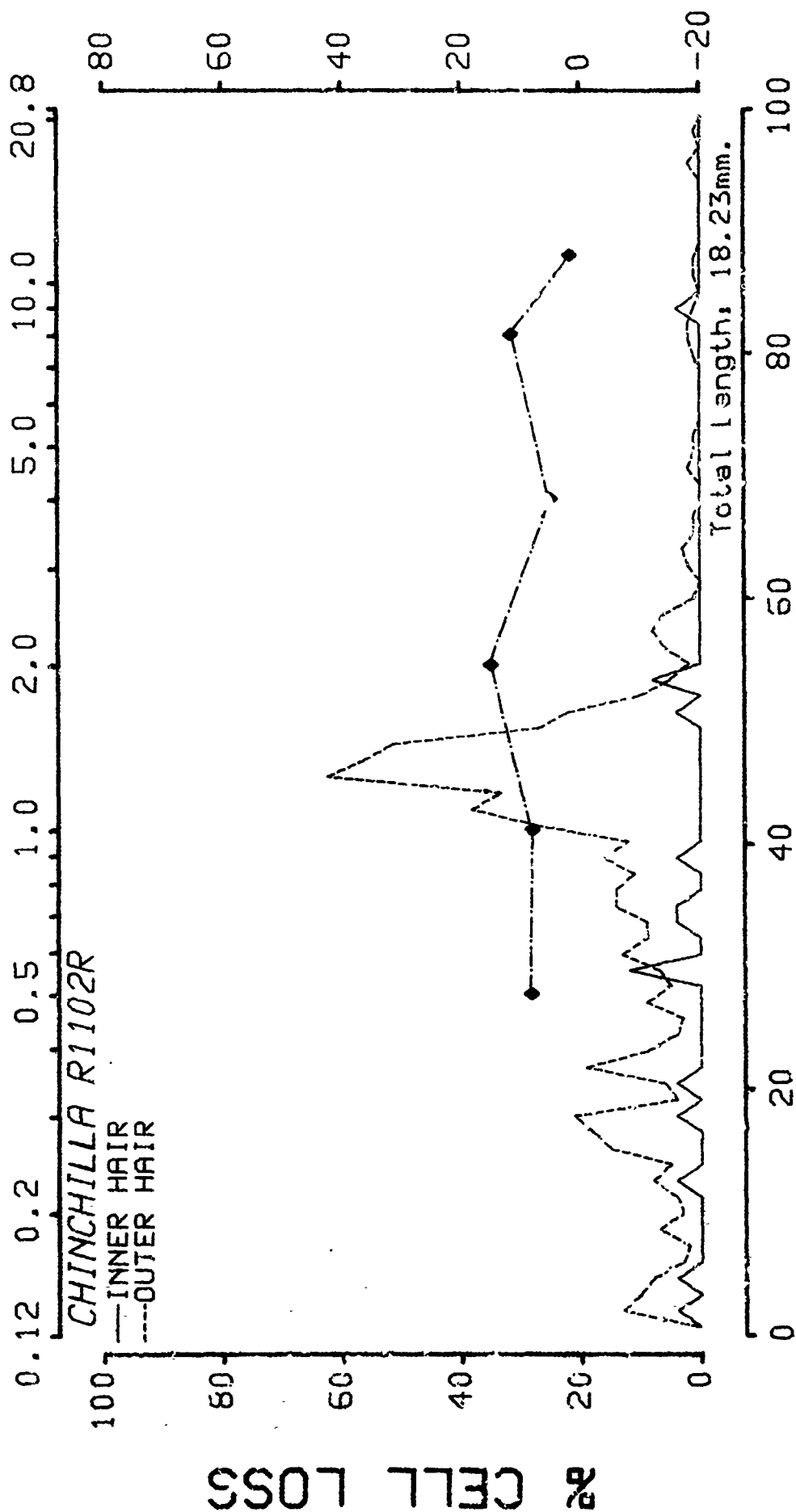
| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1280R | | | | | | | |
| 0.125 kHz | 0 | 2 | 5 | 22 | 29 | 0 | 0 |
| 0.25 kHz | 0 | 3 | 5 | 19 | 27 | 0 | 0 |
| 0.5 kHz | 1 | 5 | 6 | 7 | 18 | 0 | 0 |
| 1 kHz | 0 | 8 | 1 | 2 | 11 | 1 | 0 |
| 2 kHz | 0 | 21 | 26 | 25 | 72 | 0 | 0 |
| 4 kHz | 0 | 9 | 21 | 22 | 52 | 0 | 0 |
| 8 kHz | 4 | 14 | 16 | 15 | 45 | 2 | 3 |
| 16 kHz | 0 | 1 | 1 | 0 | 2 | 0 | 0 |
| TOTALS | 5 | 63 | 81 | 112 | 256 | 3 | 3 |

CHINCHILLA R1293R

| | | | | | | | |
|-----------|----|-----|-----|-----|------|----|----|
| 0.125 kHz | 2 | 13 | 38 | 38 | 89 | 0 | 1 |
| 0.25 kHz | 4 | 7 | 13 | 30 | 50 | 0 | 0 |
| 0.5 kHz | 0 | 32 | 68 | 39 | 139 | 0 | 1 |
| 1 kHz | 10 | 322 | 309 | 209 | 840 | 3 | 22 |
| 2 kHz | 11 | 265 | 267 | 187 | 719 | 4 | 15 |
| 4 kHz | 18 | 67 | 72 | 36 | 175 | 22 | 21 |
| 8 kHz | 2 | 4 | 6 | 7 | 17 | 0 | 0 |
| 16 kHz | 1 | 4 | 3 | 2 | 9 | 0 | 0 |
| TOTALS | 48 | 732 | 784 | 550 | 2066 | 29 | 60 |

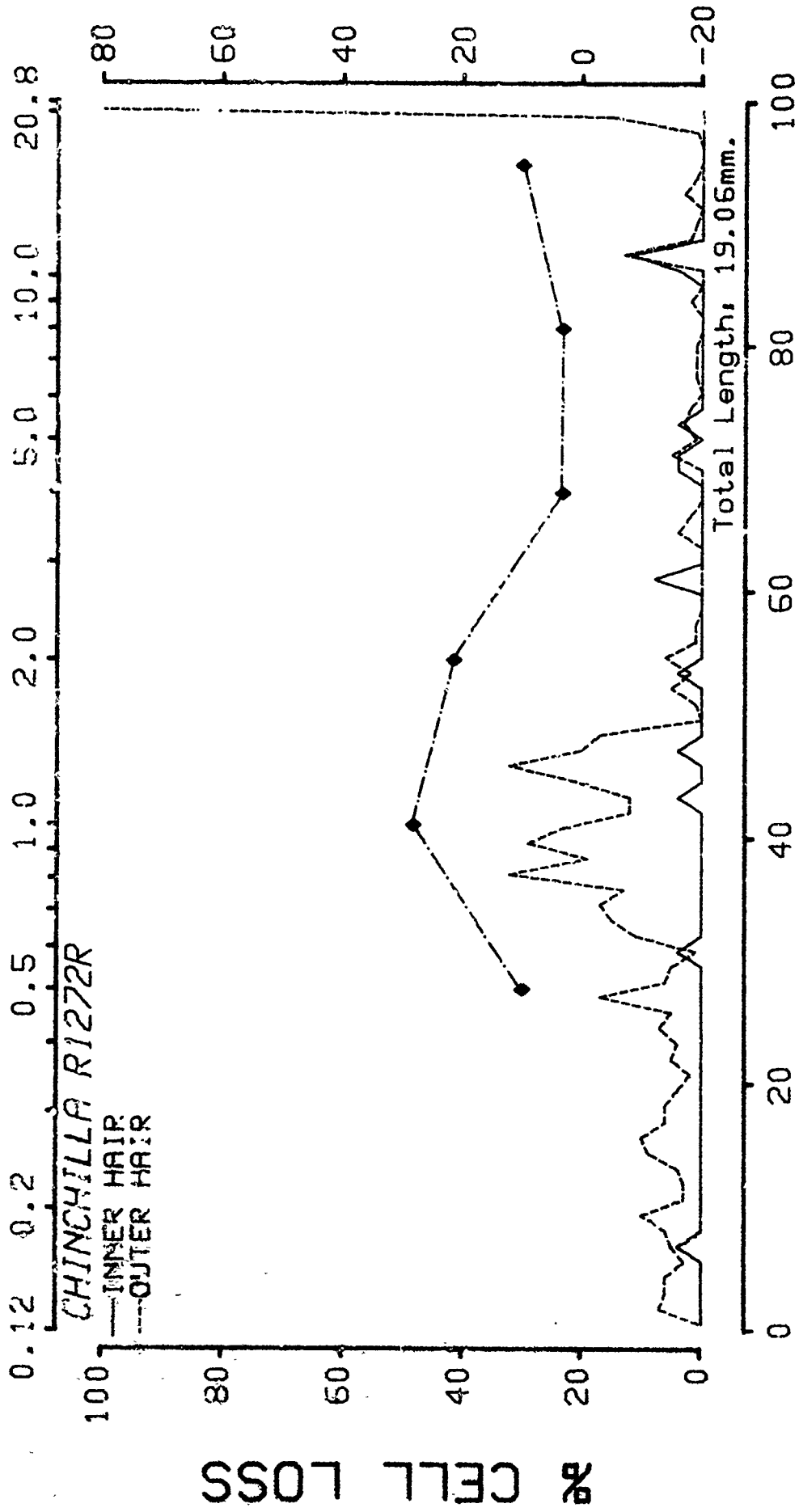
Cochleograms and PTS Audiograms
for Individual Animals

FREQUENCY (kHz)



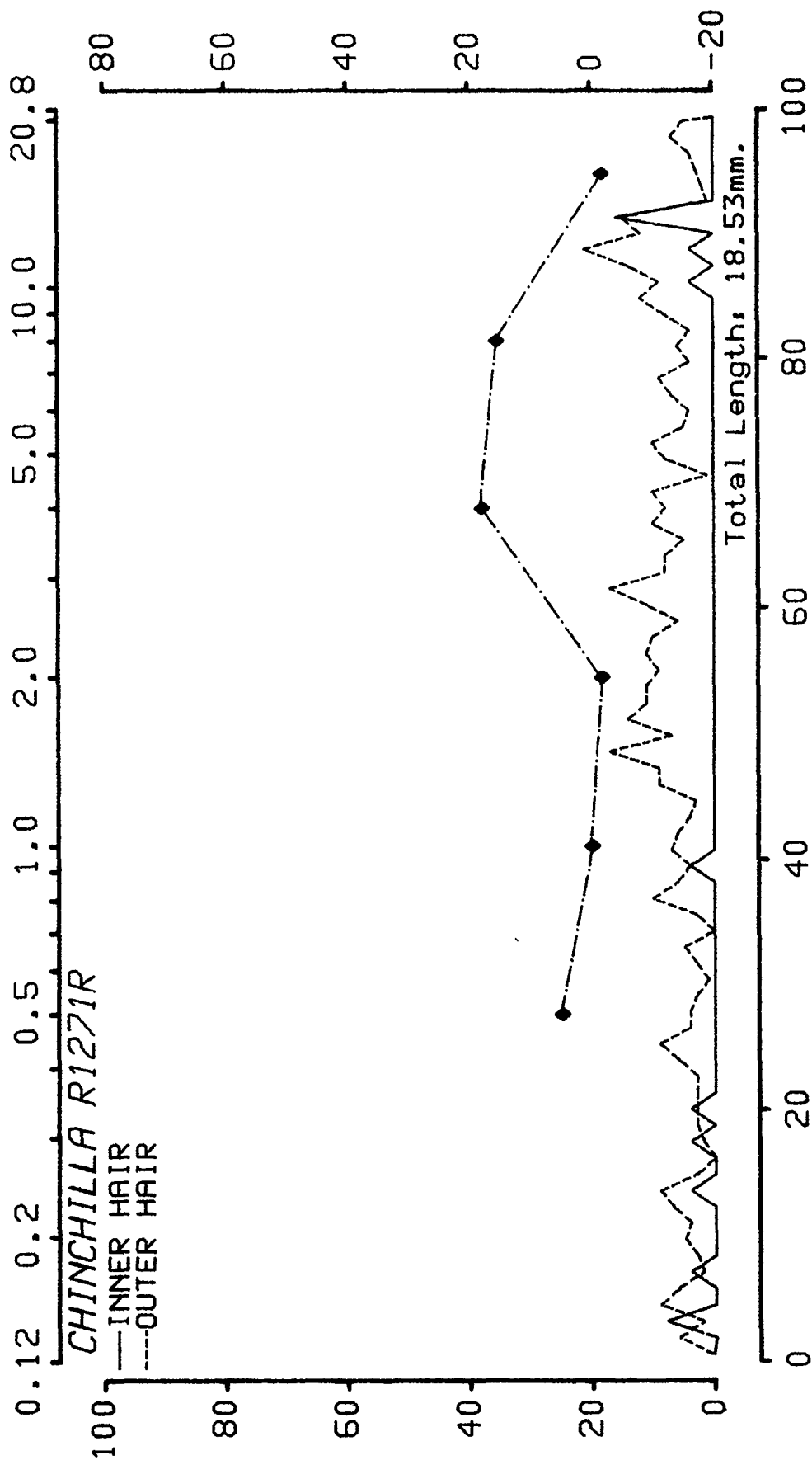
% TOTAL DISTANCE FROM APEX

FREQUENCY (KHZ)



% TOTAL DISTANCE FROM APEX

FREQUENCY (KHz)



% CELL LOSS

% TOTAL DISTANCE FROM APEX

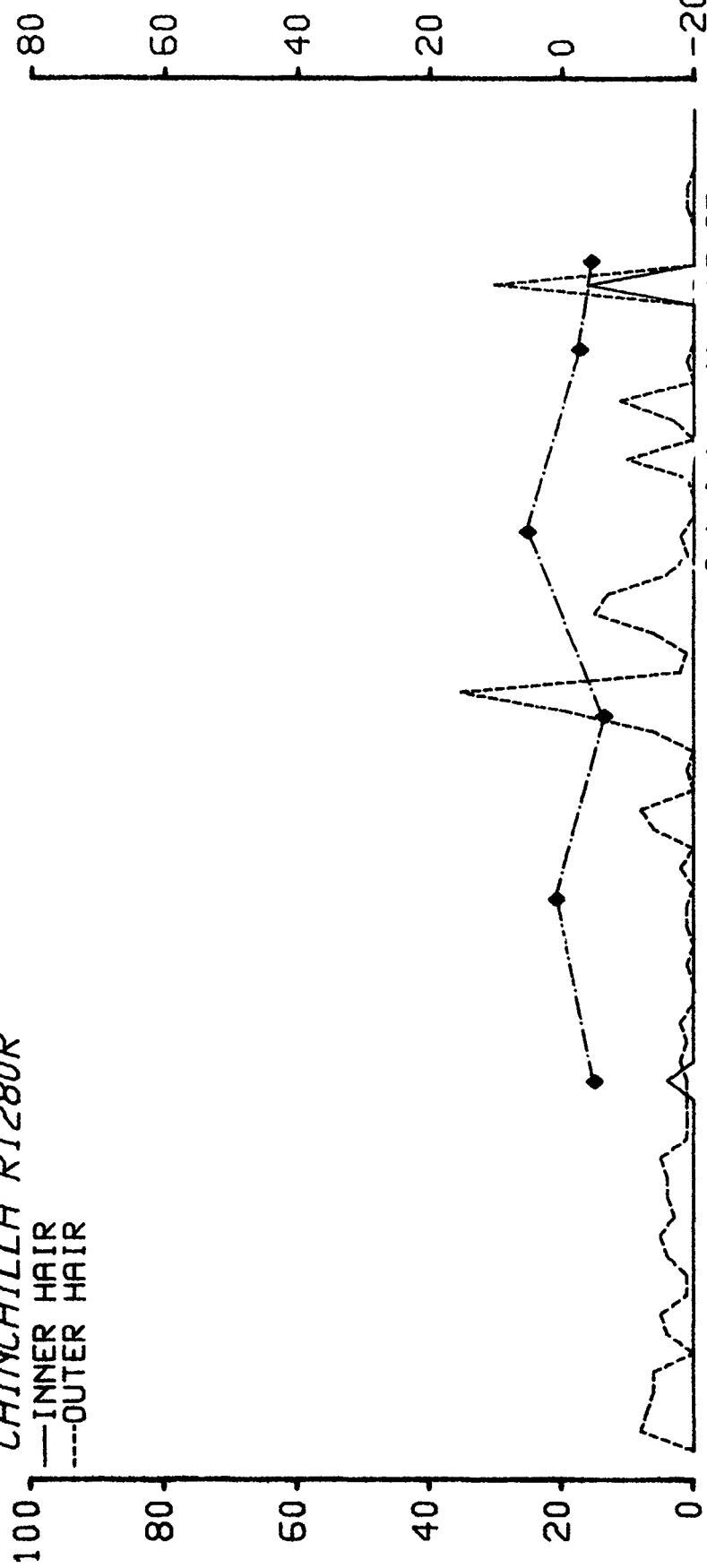
FREQUENCY (KHZ)

0.12 0.2 0.5 1.0 2.0 5.0 10.0 20.8

CHINCHILLA R1280R

— INNER HAIR
--- OUTER HAIR

% CELL LOSS



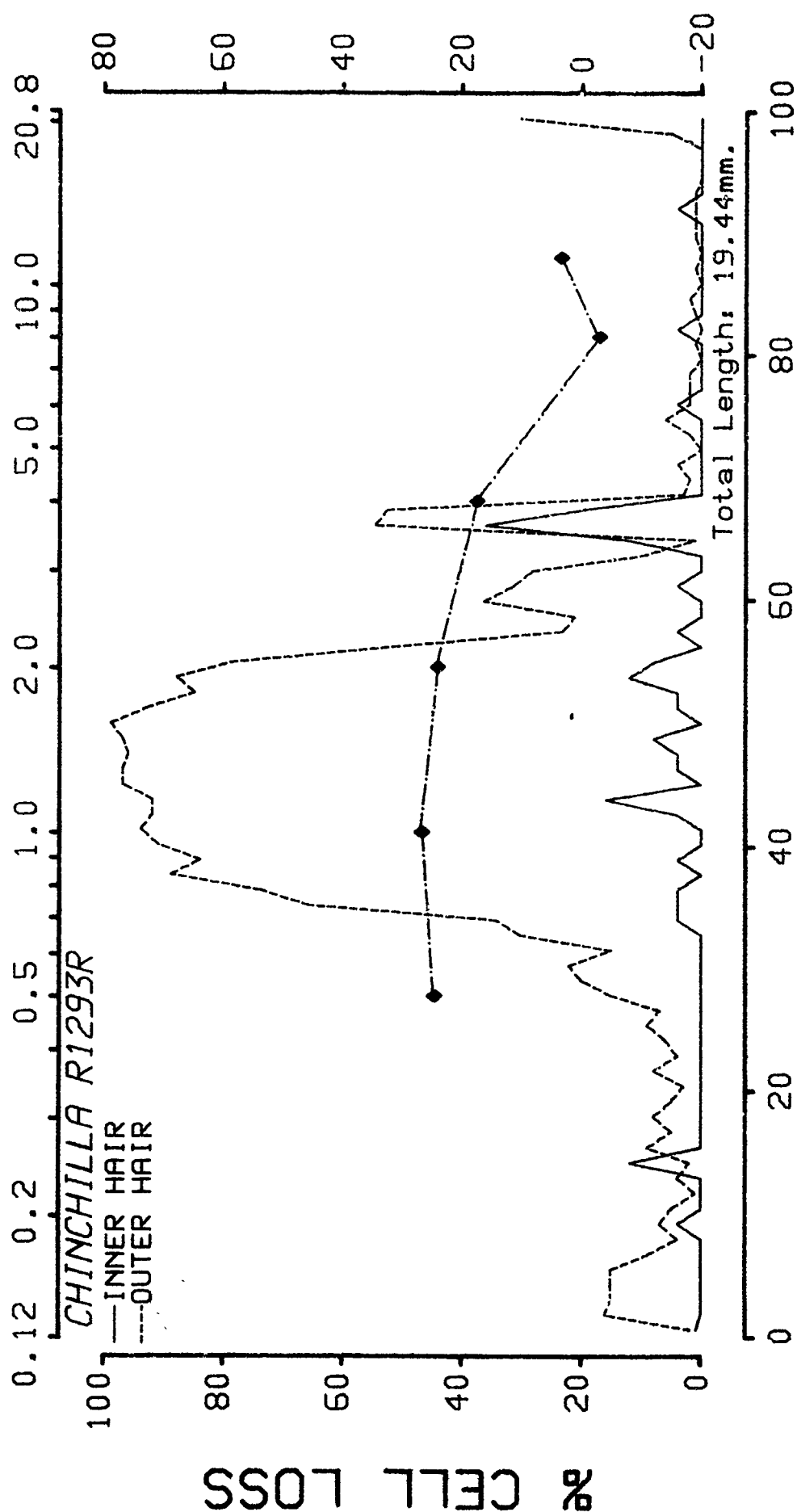
PTS (db)

Total Length: 16.83mm.

% TOTAL DISTANCE FROM APEX

0 20 40 60 80 100

FREQUENCY (kHz)



% TOTAL DISTANCE FROM APEX

Summary Data for the Group Exposed to:

155 dB, 10X, 1/10M

Animal

| | | |
|------|---|-------------------------------|
| 1925 | - | Completed the Entire Protocol |
| 1931 | - | Completed the Entire Protocol |
| 1948 | - | Completed the Entire Protocol |
| 1967 | - | Completed the Entire Protocol |
| 1974 | - | Completed the Entire Protocol |

155 dB 10X 1/10M

PRE-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1925 | 24.2 | 10.8 | 15.8 | 10.8 | 25.8 | 37.5 | ***** |
| 1931 | 27.5 | 15.8 | 24.2 | 10.8 | 33.5 | 46.3 | ***** |
| 1948 | 17.5 | 7.5 | 19.2 | 15.8 | 22.5 | 27.5 | ***** |
| 1967 | 26.2 | 16.2 | 11.2 | 12.8 | 26.2 | 22.8 | ***** |
| 1974 | 19.2 | 9.2 | 12.5 | 15.8 | 28.8 | 27.5 | ***** |
| Mean | 22.9 | 11.9 | 16.6 | 13.2 | 27.4 | 32.3 | ***** |
| S.D. | 4.4 | 3.9 | 5.3 | 2.5 | 4.1 | 9.4 | ***** |

POST-EXPOSURE THRESHOLDS (dB SPL)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|------|------|------|------|------|------|-------|
| 1925 | 20.8 | 17.5 | 27.5 | 7.5 | 29.2 | 32.5 | ***** |
| 1931 | 22.5 | 17.5 | 22.5 | 9.2 | 32.5 | 45.8 | ***** |
| 1948 | 20.8 | 12.5 | 17.5 | 14.2 | 20.8 | 27.5 | ***** |
| 1967 | 14.2 | 5.8 | 7.5 | 9.2 | 27.5 | 32.5 | ***** |
| 1974 | 20.8 | 15.8 | 25.8 | 17.5 | 27.5 | 25.8 | ***** |
| Mean | 19.8 | 13.8 | 20.2 | 11.5 | 27.5 | 32.8 | ***** |
| S.D. | 3.3 | 4.9 | 8.0 | 4.2 | 4.3 | 7.8 | ***** |

PERMANENT THRESHOLD SHIFT (dB)

| Animal\kHz | 0.5 | 1.0 | 2.0 | 4.0 | 8.0 | 11.2 | 16.0 |
|------------|-------|-------|------|------|------|------|-------|
| 1925 | -3.3 | 6.7 | 11.7 | -3.3 | 3.3 | -5.0 | ***** |
| 1931 | -5.0 | 1.7 | -1.7 | -1.7 | -1.0 | -0.4 | ***** |
| 1948 | 3.3 | 5.0 | -1.7 | -1.7 | -1.7 | 0.0 | ***** |
| 1967 | -12.0 | -10.3 | -3.7 | -3.7 | 1.3 | 9.7 | ***** |
| 1974 | 1.7 | 6.7 | 13.3 | 1.7 | -1.2 | -1.7 | ***** |
| Mean | -3.1 | 1.9 | 3.6 | -1.7 | 0.2 | 0.5 | ***** |
| S.D. | 6.1 | 7.2 | 8.2 | 2.1 | 2.1 | 5.5 | ***** |

155 dB 10X 1/10M

TEMPORARY THRESHOLD SHIFT (dB)

| | | Frequency 0.5 kHz | | | | |
|-----------|------|-------------------|------|------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1925 | 28.3 | 63.3 | 63.3 | 3.3 | -1.7 | 63.3 |
| 1931 | 10.0 | 5.0 | -5.0 | -5.0 | -5.0 | 10.0 |
| 1948 | 25.0 | 25.0 | 0.0 | 10.0 | 0.0 | 25.0 |
| 1967 | 1.3 | -3.7 | -8.7 | -8.7 | -8.7 | 1.3 |
| 1974 | 33.3 | 18.3 | 13.3 | 8.3 | -1.7 | 33.3 |
| Mean | 19.6 | 21.6 | 12.6 | 1.6 | -3.4 | 26.6 |
| S.D. | 13.4 | 25.9 | 29.6 | 8.2 | 3.5 | 24.0 |

| | | Frequency 2.0 kHz | | | | |
|-----------|-------|-------------------|------|------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1925 | 74.2* | 79.2* | 76.7 | 31.7 | 16.7 | 79.2 |
| 1931 | 8.3 | 3.3 | -1.7 | -1.7 | -1.7 | 8.3 |
| 1948 | 33.3 | 23.3 | 3.3 | 8.3 | -1.7 | 33.3 |
| 1967 | 1.3 | 6.3 | 1.3 | -3.7 | -3.7 | 6.3 |
| 1974 | 60.0 | 55.0 | 35.0 | 30.0 | 15.0 | 60.0 |
| Mean | 35.4 | 33.4 | 22.9 | 12.9 | 4.9 | 37.4 |
| S.D. | 31.6 | 32.8 | 33.5 | 17.0 | 10.0 | 32.0 |

| | | Frequency 8.0 kHz | | | | |
|-----------|------|-------------------|------|------|------|------|
| Animal\Hr | 0 | 2 | 8 | 24 | 240 | Max |
| 1925 | 36.7 | 71.7 | 71.7 | 1.7 | 11.7 | 71.7 |
| 1931 | 14.0 | 4.0 | -1.0 | -1.0 | -6.0 | 14.0 |
| 1948 | 50.0 | 40.0 | 10.0 | 5.0 | 0.0 | 50.0 |
| 1967 | 11.3 | 11.3 | 11.3 | 1.3 | 1.3 | 11.3 |
| 1974 | 48.8 | 58.8 | 13.8 | 3.7 | -6.2 | 58.8 |
| Mean | 32.2 | 37.2 | 21.1 | 2.2 | 0.2 | 41.2 |
| S.D. | 18.6 | 29.3 | 28.8 | 2.3 | 7.3 | 27.1 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 1/10M

Probe Frequency: 0.5 kHz

Masker (kHz): 0.150 0.200 0.300 0.400 0.520 0.600 0.650 0.750 1.300 2.200

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|-------|-------|
| 1925 (3.33) | 72.5 | 67.5 | 62.5 | 57.5 | 32.5 | 37.5 | 47.5 | 42.5 | 87.5 | 92.5 |
| 1931 (1.19) | 62.5 | 62.5 | 47.5 | 37.5 | 27.5 | 27.5 | 27.5 | 32.5 | 57.5 | 87.5 |
| 1948 (1.41) | 62.5 | 57.5 | 27.5 | 27.5 | 22.5 | 22.5 | 32.5 | 27.5 | 82.5 | 87.5 |
| 1967 (1.66) | 77.5 | 72.5 | 57.5 | 57.5 | 42.5 | 42.5 | 47.5 | 52.5 | 90.0* | 97.5 |
| 1974 (3.11) | 62.5 | 62.5 | 47.5 | 42.5 | 32.5 | 27.5 | 37.5 | 37.5 | 77.5 | 95.0* |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (2.14) | 67.5 | 64.5 | 48.5 | 44.5 | 31.5 | 31.5 | 38.5 | 38.5 | 79.0 | 92.0 |
| S.D. (1.00) | 7.1 | 5.7 | 13.4 | 13.0 | 7.4 | 8.2 | 8.9 | 9.6 | 12.9 | 4.5 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|-------|-------|
| 1925 (1.66) | 67.5 | 57.5 | 47.5 | 47.5 | 32.5 | 32.5 | 37.5 | 42.5 | 82.5 | 92.5 |
| 1931 (1.66) | 67.5 | 62.5 | 52.5 | 42.5 | 27.5 | 27.5 | 27.5 | 37.5 | 57.5 | 85.0* |
| 1948 (0.75) | 62.5 | 62.5 | 32.5 | 27.5 | 27.5 | 32.5 | 32.5 | 32.5 | 67.5 | 87.5 |
| 1967 (3.19) | 62.5 | 57.5 | 42.5 | 37.5 | 22.5 | 32.5 | 32.5 | 37.5 | 90.0* | 92.5 |
| 1974 (1.72) | 72.5 | 67.5 | 57.5 | 47.5 | 42.5 | 37.5 | 42.5 | 47.5 | 72.5 | 92.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (1.80) | 66.5 | 61.5 | 46.5 | 40.5 | 30.5 | 32.5 | 34.5 | 39.5 | 74.0 | 90.0 |
| S.D. (0.88) | 4.2 | 4.2 | 9.6 | 8.4 | 7.6 | 3.5 | 5.7 | 5.7 | 12.7 | 3.5 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 1/10M

Probe Frequency: 1.0 kHz

Masker (kHz): 0.150 0.200 0.400 0.550 0.800 1.050 1.300 1.700 1.900 2.500

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|-------|-------|
| 1925 (0.97) | 77.5 | 72.5 | 62.5 | 32.5 | 27.5 | 27.5 | 32.5 | 67.5 | 85.0* | 97.5 |
| 1931 (2.10) | 72.5 | 77.5 | 42.5 | 47.5 | 37.5 | 27.5 | 37.5 | 52.5 | 52.5 | 77.5 |
| 1948 (2.55) | 77.5 | 72.5 | 32.5 | 27.5 | 32.5 | 22.5 | 37.5 | 57.5 | 62.5 | 97.5 |
| 1967 (0.96) | 77.5 | 77.5 | 67.5 | 47.5 | 42.5 | 42.5 | 47.5 | 87.5 | 92.5 | 97.5 |
| 1974 (1.09) | 72.5 | 72.5 | 37.5 | 32.5 | 32.5 | 27.5 | 32.5 | 62.5 | 67.5 | 95.0* |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (1.53) | 75.5 | 74.5 | 48.5 | 37.5 | 34.5 | 29.5 | 37.5 | 65.5 | 72.0 | 93.0 |
| S.D. (0.74) | 2.7 | 2.7 | 15.6 | 9.4 | 5.7 | 7.6 | 6.1 | 13.5 | 16.4 | 8.7 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|-------|------|--------|
| 1925 (1.12) | 77.5 | 77.5 | 37.5 | 37.5 | 37.5 | 32.5 | 42.5 | 87.5 | 92.5 | 97.5 |
| 1931 (1.69) | 72.5 | 72.5 | 62.5 | 37.5 | 32.5 | 22.5 | 27.5 | 42.5 | 52.5 | 82.5 |
| 1948 (2.55) | 77.5 | 72.5 | 62.5 | 47.5 | 37.5 | 27.5 | 42.5 | 57.5 | 82.5 | 105.0* |
| 1967 (1.55) | 77.5 | 72.5 | 52.5 | 42.5 | 32.5 | 27.5 | 32.5 | 75.0* | 82.5 | 97.5 |
| 1974 (0.94) | 72.5 | 72.5 | 62.5 | 52.5 | 42.5 | 42.5 | 42.5 | 77.5 | 87.5 | 97.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (1.57) | 75.5 | 73.5 | 55.5 | 43.5 | 36.5 | 30.5 | 37.5 | 68.0 | 79.5 | 96.0 |
| S.D. (0.63) | 2.7 | 2.2 | 11.0 | 6.5 | 4.2 | 7.6 | 7.1 | 17.9 | 15.7 | 8.2 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 1/10M

Probe Frequency: 2.0 kHz

Masker (kHz): 0.300 0.750 0.900 1.300 1.700 2.050 2.200 3.000 3.500 4.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|-------|-------|
| 1925 (7.27) | 47.5 | 42.5 | 42.5 | 52.5 | 42.5 | 22.5 | 37.5 | 52.5 | 57.5 | 92.5 |
| 1931 (3.61) | 47.5 | 42.5 | 42.5 | 47.5 | 52.5 | 37.5 | 42.5 | 62.5 | 72.5 | 95.0* |
| 1948 (6.05) | 47.5 | 42.5 | 42.5 | 47.5 | 42.5 | 27.5 | 42.5 | 62.5 | 85.0* | 97.5 |
| 1967 (8.33) | 67.5 | 42.5 | 37.5 | 52.5 | 47.5 | 22.5 | 37.5 | 67.5 | 87.5 | 95.0* |
| 1974 (8.33) | 72.5 | 52.5 | 42.5 | 47.5 | 47.5 | 22.5 | 37.5 | 52.5 | 85.0* | 97.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (6.72) | 56.5 | 44.5 | 41.5 | 49.5 | 46.5 | 26.5 | 39.5 | 59.5 | 77.5 | 95.5 |
| S.D. (1.98) | 12.4 | 4.5 | 2.2 | 2.7 | 4.2 | 6.5 | 2.7 | 6.7 | 12.6 | 2.1 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|-------|-------|-------|-------|
| 1925 (2.06) | 57.5 | 57.5 | 52.5 | 47.5 | 57.5 | 47.5 | 47.5 | 42.5 | 57.5 | 87.5 |
| 1931 (6.14) | 67.5 | 47.5 | 37.5 | 27.5 | 42.5 | 22.5 | 32.5 | 57.5 | 42.5 | 87.5 |
| 1948 (1.97) | 82.5 | 57.5 | 52.5 | 37.5 | 32.5 | 27.5 | 32.5 | 57.5 | 87.5 | 97.5 |
| 1967 (7.27) | 62.5 | 47.5 | 37.5 | 32.5 | 37.5 | 17.5 | 32.5 | 57.5 | 85.0* | 95.0* |
| 1974 (11.02) | 77.5 | 52.5 | 52.5 | 47.5 | 62.5 | 37.5 | 75.0* | 90.0* | 92.5 | 97.5 |

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Mean (5.69) | 69.5 | 52.5 | 46.5 | 38.5 | 46.5 | 30.5 | 44.0 | 57.0 | 73.0 | 93.0 |
| S.D. (3.81) | 10.4 | 5.0 | 8.2 | 8.9 | 12.9 | 12.0 | 18.5 | 20.5 | 21.8 | 5.1 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 1/10M

Probe Frequency: 4.0 kHz

Masker (k^r): 0.450 1.300 2.200 3.000 3.500 4.100 4.500 5.000 5.600 6.000

Animal (Q-10 dB)

Pre-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|-------|------|------|
| 1925 (2.16) | 57.5 | 57.5 | 52.5 | 47.5 | 37.5 | 37.5 | 42.5 | 62.5 | 87.5 | 92.5 |
| 1931 (4.40) | 57.5 | 52.5 | 52.5 | 42.5 | 37.5 | 22.5 | 27.5 | 47.5 | 57.5 | 62.5 |
| 1948 (5.06) | 67.5 | 57.5 | 57.5 | 57.5 | 52.5 | 37.5 | 47.5 | 67.5 | 87.5 | 87.5 |
| 1967 (2.85) | 67.5 | 52.5 | 47.5 | 42.5 | 32.5 | 37.5 | 52.5 | 75.0* | 77.5 | 82.5 |
| 1974 (2.01) | 77.5 | 57.5 | 52.5 | 47.5 | 37.5 | 37.5 | 37.5 | 57.5 | 67.5 | 77.5 |

| | | | | | | | | | | | |
|------|---------|------|------|------|------|------|------|------|------|------|------|
| Mean | (3.30) | 65.5 | 55.5 | 52.5 | 47.5 | 39.5 | 34.5 | 41.5 | 62.0 | 75.5 | 80.5 |
| S.D. | (1.37) | 8.4 | 2.7 | 3.5 | 6.1 | 7.6 | 6.7 | 9.6 | 10.4 | 13.0 | 11.5 |

Animal (Q-10 dB)

Post-Exposure

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| 1925 (3.12) | 72.5 | 52.5 | 57.5 | 42.5 | 22.5 | 22.5 | 37.5 | 42.5 | 47.5 | 52.5 |
| 1931 (2.97) | 72.5 | 47.5 | 52.5 | 32.5 | 22.5 | 17.5 | 22.5 | 42.5 | 47.5 | 62.5 |
| 1948 (3.49) | 77.5 | 57.5 | 57.5 | 52.5 | 37.5 | 32.5 | 42.5 | 67.5 | 82.5 | 87.5 |
| 1967 (3.26) | 77.5 | 52.5 | 52.5 | 42.5 | 32.5 | 27.5 | 37.5 | 57.5 | 67.5 | 82.5 |
| 1974 (3.26) | 77.5 | 67.5 | 57.5 | 52.5 | 42.5 | 37.5 | 47.5 | 67.5 | 82.5 | 92.5 |

| | | | | | | | | | | |
|------|---------|------|------|------|------|------|------|------|------|------|
| Mean | (3.22) | 75.5 | 55.5 | 44.5 | 31.5 | 27.5 | 37.5 | 55.5 | 65.5 | 75.5 |
| S.D. | (0.19) | 2.7 | 7.6 | 2.7 | 8.4 | 7.9 | 9.4 | 12.5 | 17.5 | 17.2 |

MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 1/10M

Probe Frequency: 8.0 kHz

| Masker (kHz): | 0.450 | 1.300 | 2.500 | 5.900 | 7.000 | 8.100 | 9.300 | 11.000 | 12.700 | 14.000 |
|------------------|---------------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1925 (4.31) | 67.5 | 57.5 | 57.5 | 47.5 | 42.5 | 32.5 | 47.5 | 67.5 | 85.0* | 95.0* |
| 1931 (3.69) | 87.5 | 75.5 | 67.5 | 65.0* | 72.5 | 65.0* | 57.5 | 75.0* | 85.0* | 95.0* |
| 1948 (3.13) | 82.5 | 67.5 | 67.5 | 57.5 | 42.5 | 47.5 | 62.5 | 77.5 | 85.0* | 92.5 |
| 1967 (7.24) | 82.5 | 62.5 | 62.5 | 52.5 | 20.0* | 37.5 | 62.5 | 77.5 | 82.5 | 87.5 |
| 1974 (1.61) | 77.5 | 62.5 | 62.5 | 47.5 | 57.5 | 52.5 | 57.5 | 82.5 | 87.5 | 92.5 |
| Mean | 79.5 | 65.1 | 63.5 | 54.0 | 47.0 | 47.0 | 57.5 | 76.0 | 85.0 | 92.5 |
| S.D. (2.07) | 7.6 | 6.8 | 4.2 | 7.4 | 19.6 | 12.8 | 6.1 | 5.5 | 1.8 | 3.1 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1925 (1.17) | 92.5 | 62.5 | 67.5 | 47.5 | 52.5 | 47.5 | 62.5 | 82.5 | 92.5 | 97.5 |
| 1931 (*****) | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** |
| 1948 (0.99) | 87.5 | 67.5 | 62.5 | 42.5 | 37.5 | 37.5 | 37.5 | 42.5 | 52.5 | 62.5 |
| 1967 (1.67) | 72.5 | 57.5 | 57.5 | 47.5 | 47.5 | 42.5 | 62.5 | 77.5 | 95.0* | 97.5 |
| 1974 (3.52) | 77.5 | 57.5 | 62.5 | 52.5 | 57.5 | 47.5 | 57.5 | 85.0* | 97.5 | 97.5 |
| Mean | 82.5 | 61.3 | 62.5 | 47.5 | 48.8 | 43.7 | 55.0 | 71.9 | 84.4 | 88.9 |
| S.D. (1.16) | 9.1 | 4.8 | 4.1 | 4.1 | 8.5 | 4.8 | 11.9 | 19.8 | 21.3 | 17.5 |

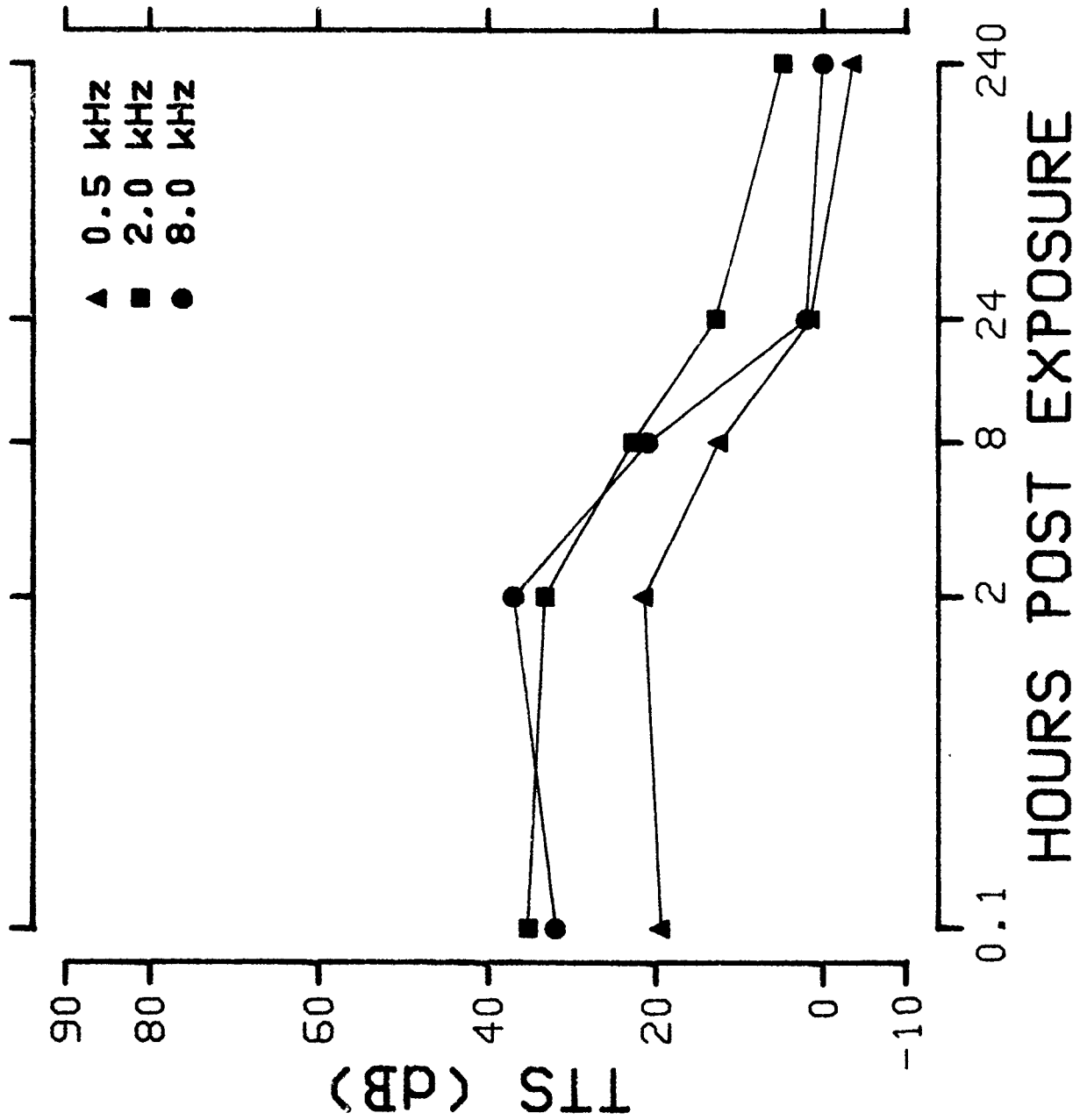
MASKED THRESHOLDS (dB SPL) Group: 155 dB 10X 1/10M

Probe Frequency: 11.2 kHz

| Masker (kHz): | 1.000 | 4.000 | 7.000 | 9.000 | 11.000 | 11.500 | 12.000 | 13.000 | 14.500 | 16.000 |
|------------------|---------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| Animal (Q-10 dB) | Pre-Exposure | | | | | | | | | |
| 1925 (3.57) | 77.5 | 72.5 | 67.5 | 55.0* | 52.5 | 47.5 | 65.0* | 72.5 | 77.5 | 87.5 |
| 1931 (3.75) | 85.0* | 67.5 | 80.0* | 65.0* | 52.5 | 47.5 | 52.5 | 52.5 | 85.0* | 95.0* |
| 1948 (2.85) | 77.5 | 67.5 | 67.5 | 67.5 | 57.5 | 52.5 | 52.5 | 52.5 | 67.5 | 95.0* |
| 1967 (6.12) | 72.5 | 52.5 | 72.5 | 52.5 | 32.5 | 37.5 | 47.5 | 47.5 | 67.5 | 72.5 |
| 1974 (3.01) | 72.5 | 57.5 | 72.5 | 57.5 | 47.5 | 47.5 | 47.5 | 62.5 | 72.5 | 87.5 |
| Mean (3.86) | 77.0 | 63.5 | 72.0 | 59.5 | 48.5 | 46.5 | 53.0 | 57.5 | 74.0 | 87.5 |
| S.D. (1.32) | 5.1 | 8.2 | 5.1 | 6.5 | 9.6 | 5.5 | 7.2 | 10.0 | 7.4 | 9.2 |
| Animal (Q-10 dB) | Post-Exposure | | | | | | | | | |
| 1925 (5.82) | 77.5 | 52.5 | 57.5 | 57.5 | 57.5 | 57.5 | 47.5 | 42.5 | 57.5 | 82.5 |
| 1931 (****) | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| 1948 (3.43) | 67.5 | 57.5 | 57.5 | 52.5 | 52.5 | 47.5 | 42.5 | 42.5 | 52.5 | 82.5 |
| 1967 (5.28) | 82.5 | 57.5 | 62.5 | 65.0* | 47.5 | 47.5 | 42.5 | 57.5 | 62.5 | 95.0* |
| 1974 (2.73) | 77.5 | 57.5 | 67.5 | 52.5 | 52.5 | 47.5 | 52.5 | 62.5 | 72.5 | 97.5 |
| Mean (4.32) | 76.3 | 56.2 | 61.3 | 56.9 | 52.5 | 50.0 | 46.3 | 51.3 | 61.3 | 89.4 |
| S.D. (1.47) | 6.3 | 2.5 | 4.8 | 5.9 | 4.1 | 5.0 | 4.8 | 10.3 | 8.5 | 8.0 |

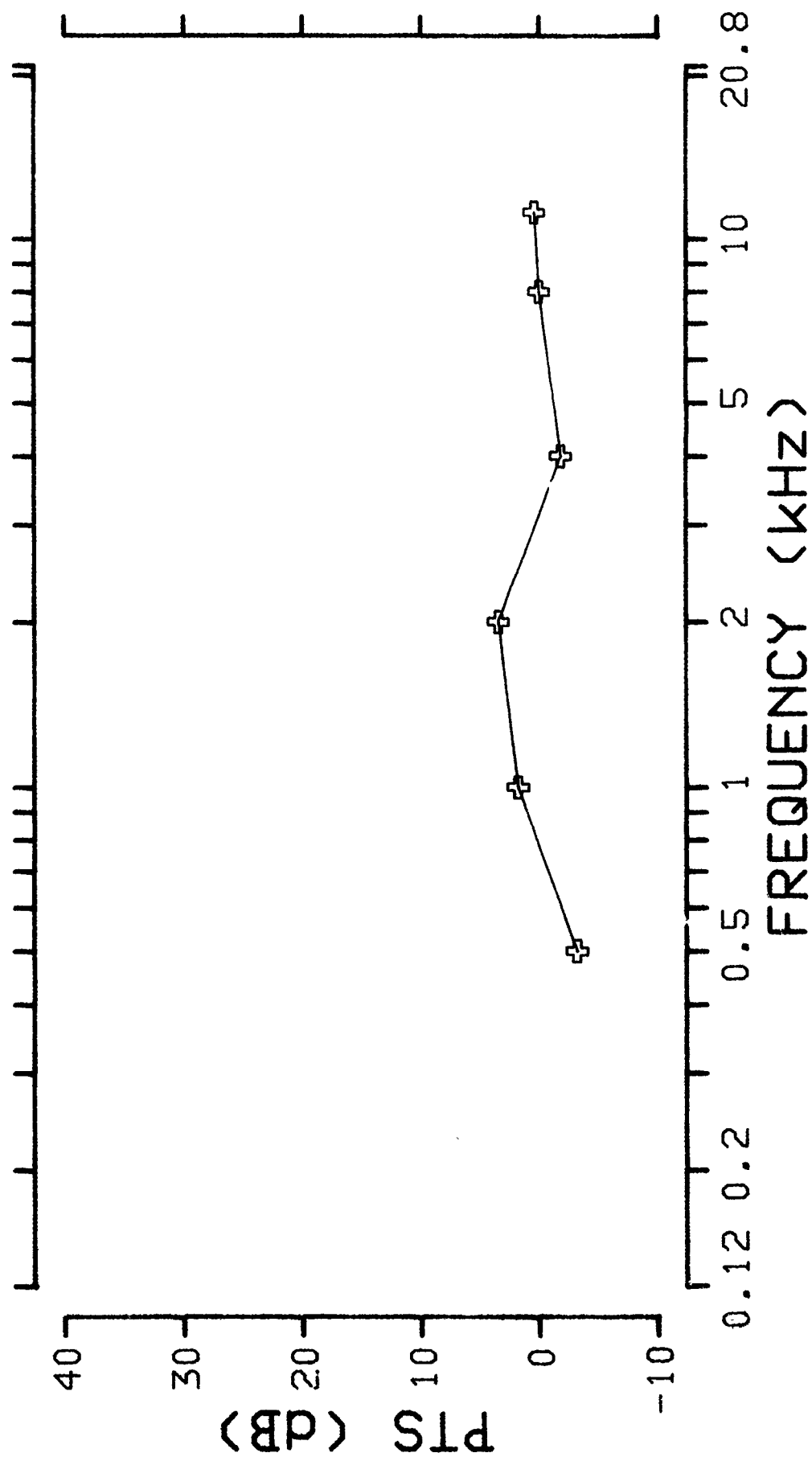
The Group Mean Recovery Curves
Measured at Three Test Frequencies

MEAN DATA (n=5) - 155 dB 10X 1/10M



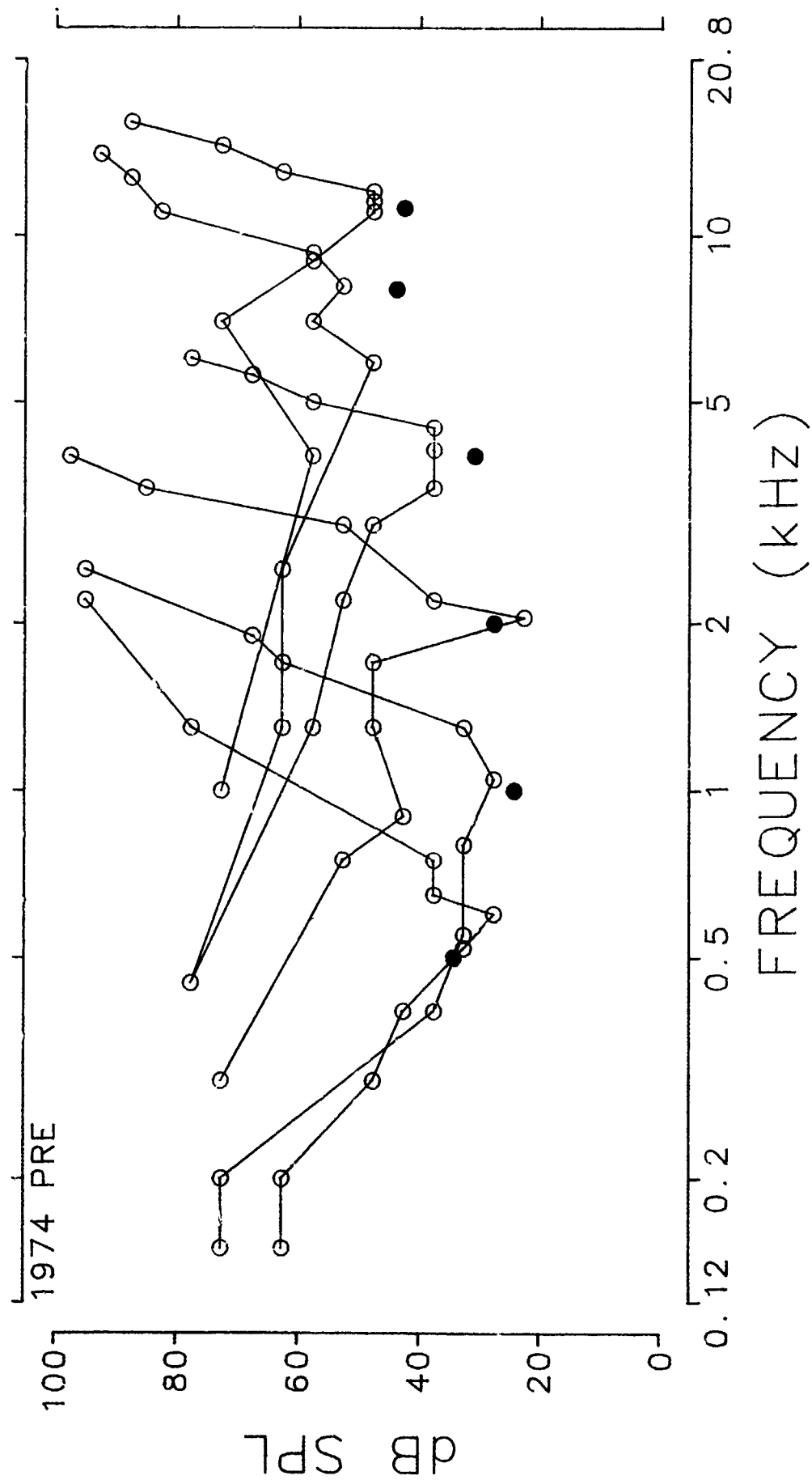
The Group Mean Permanent Threshold Shift (PTS)
for all Test Frequencies

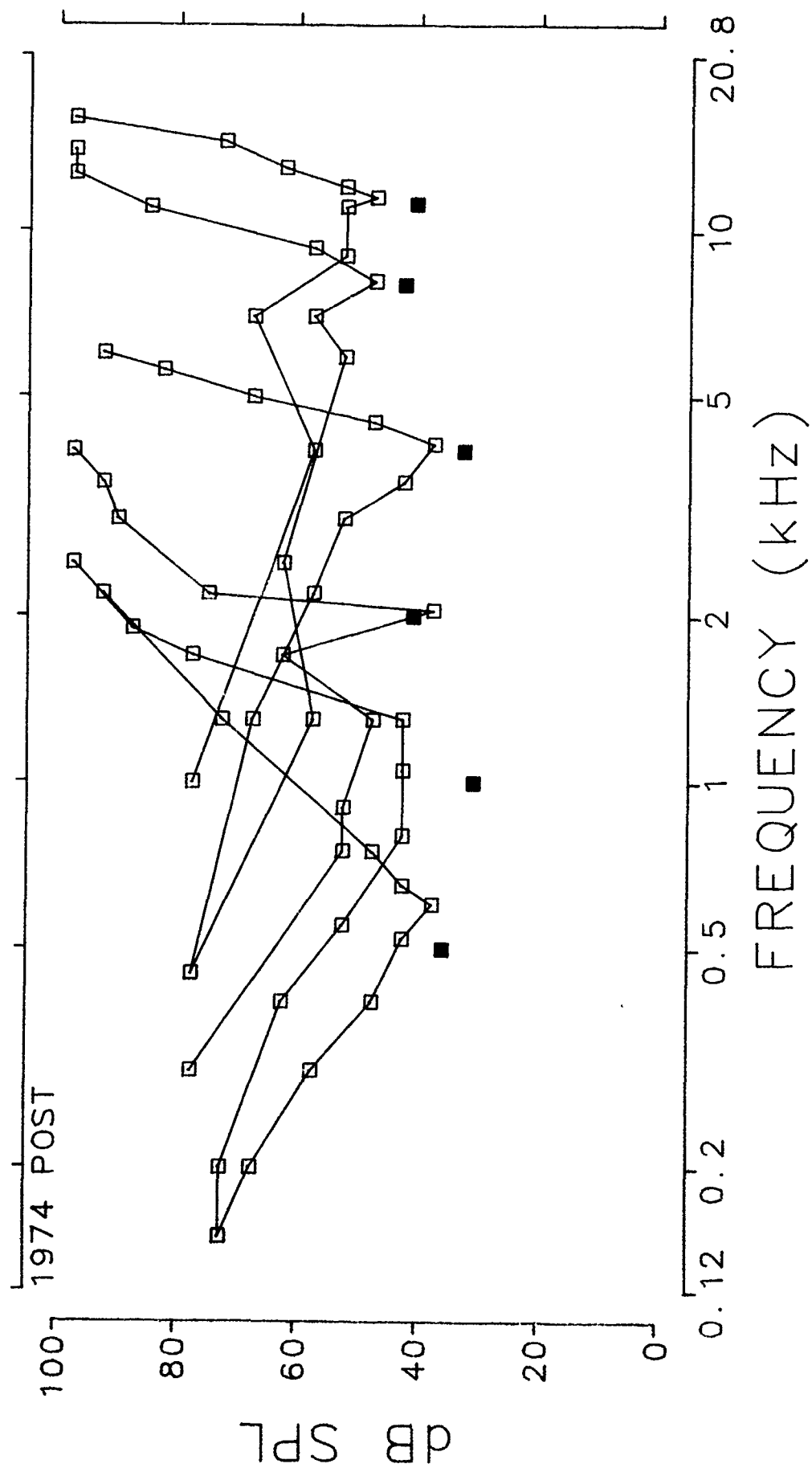
MEAN DATA (n=5) - 155 dB 10X 1/10M

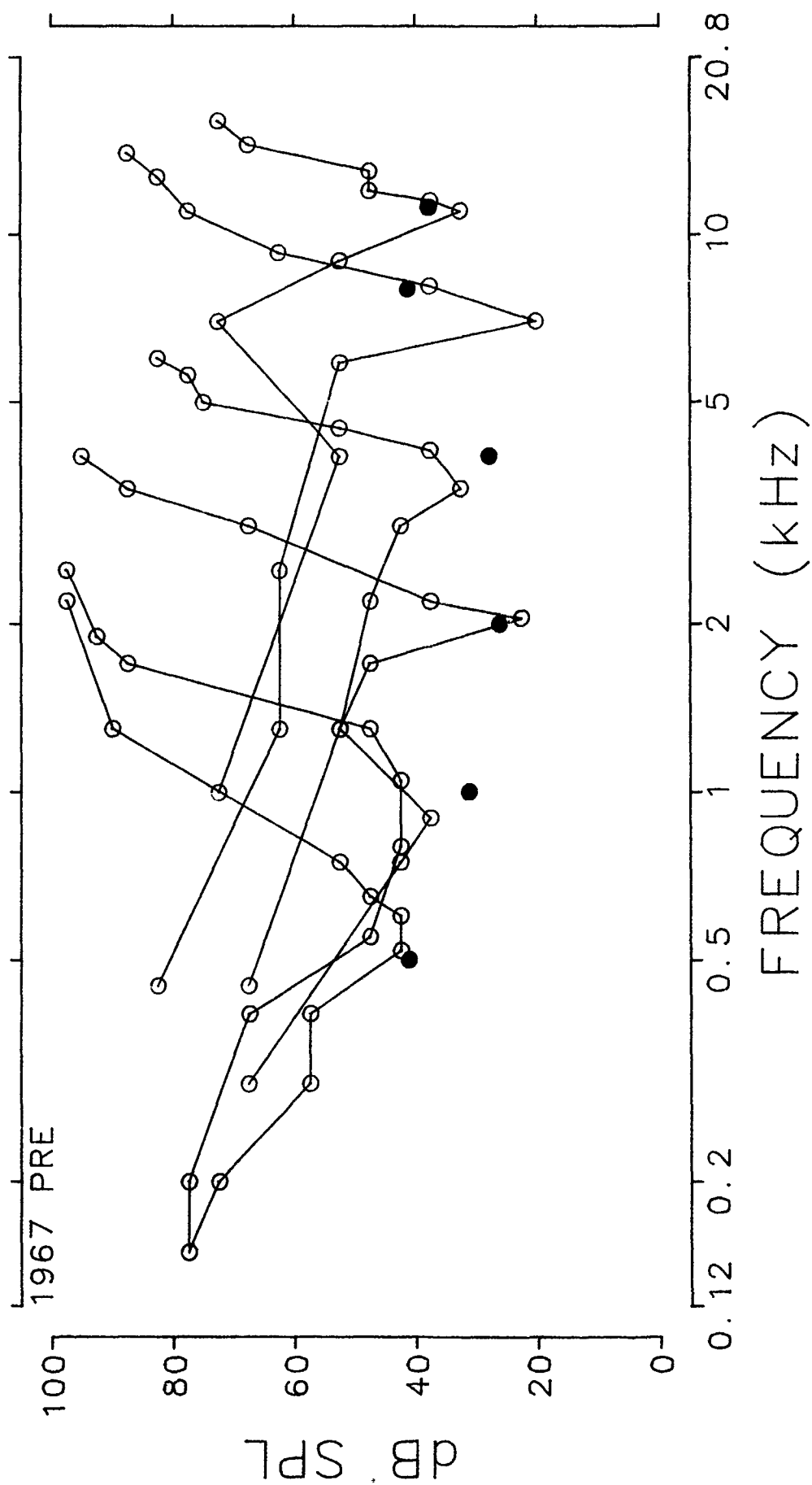


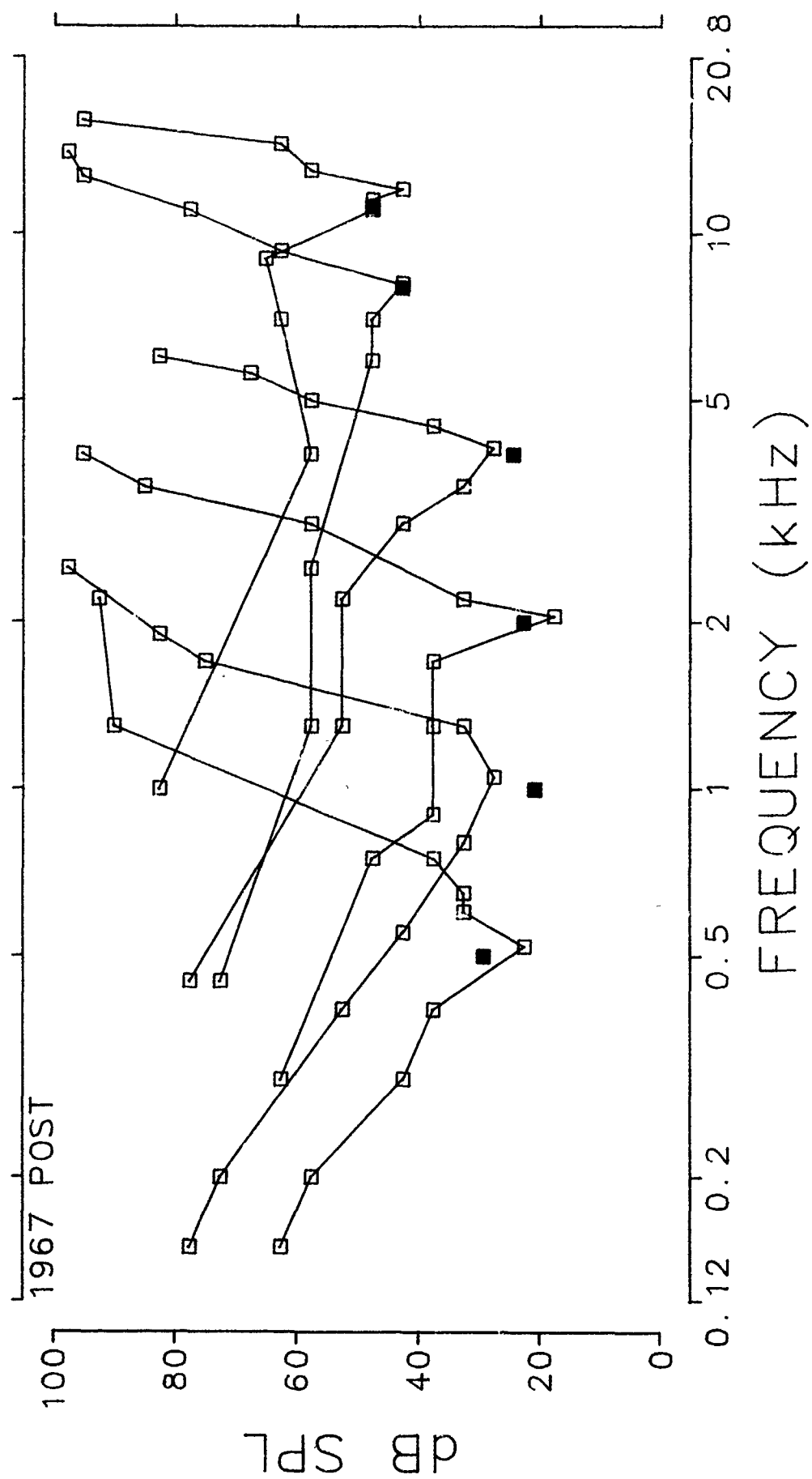
The Pre and Postexposure Tuning Curves for
Individual Animals in this Exposure Group.

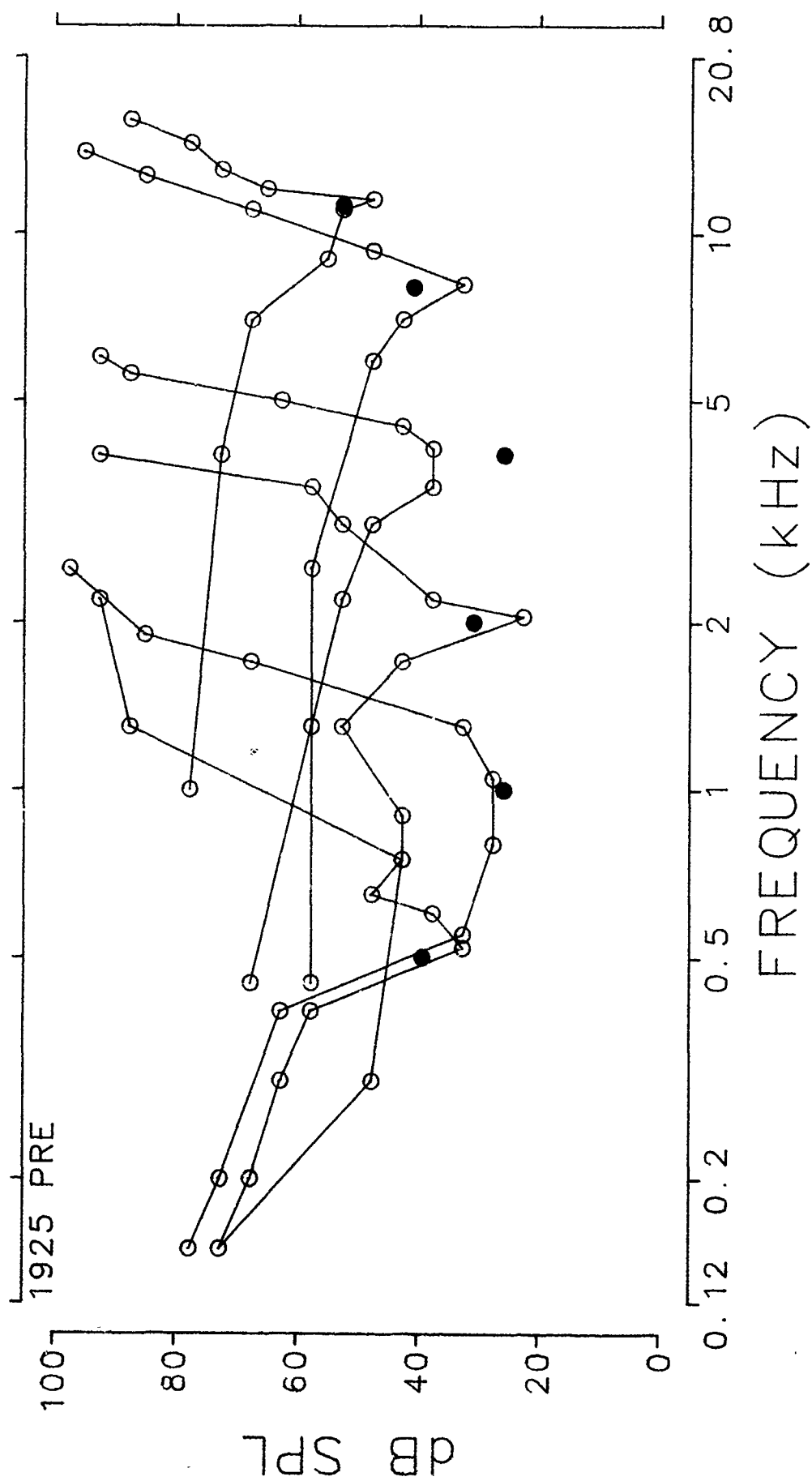
The solid symbol represents the threshold of the probe tone.

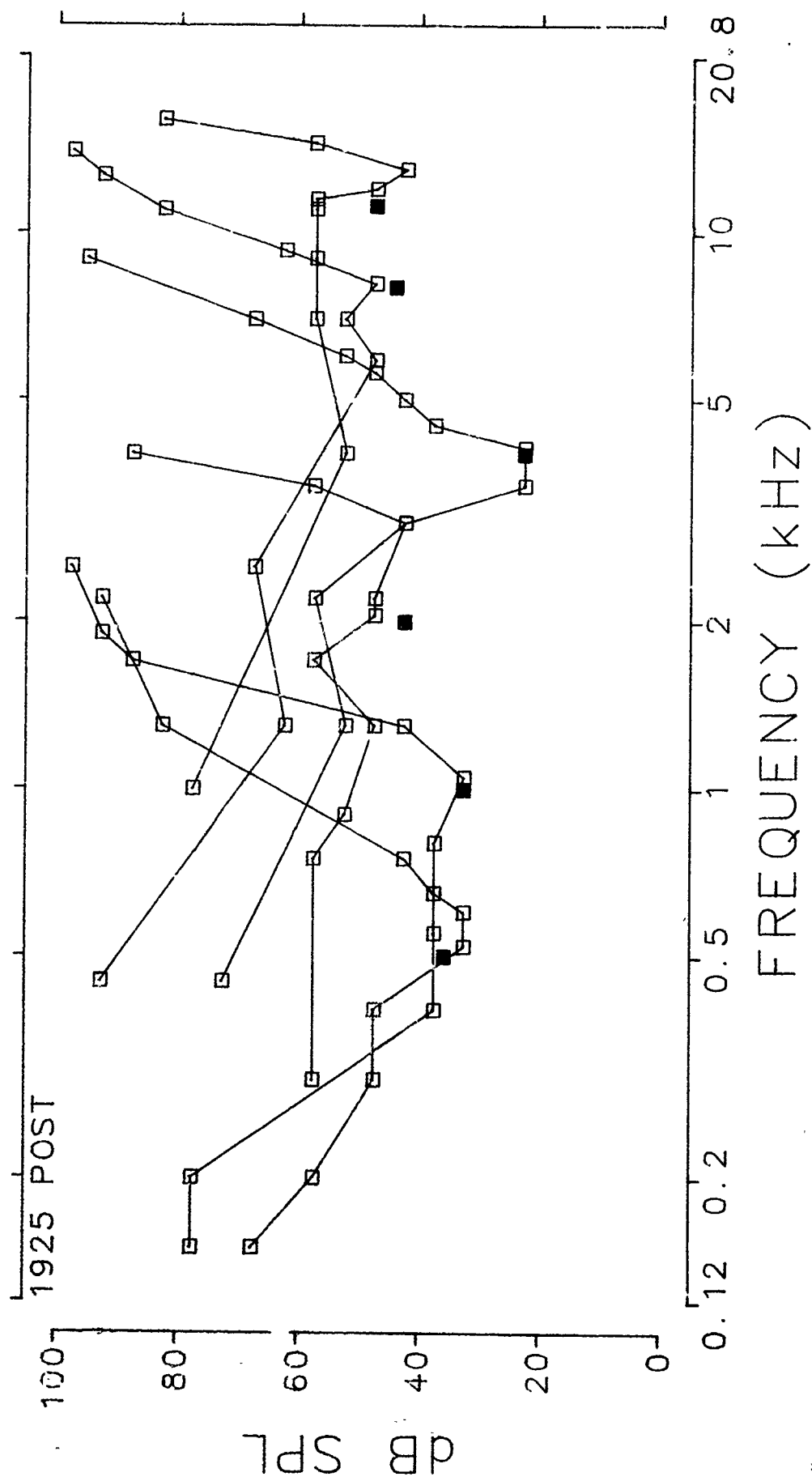


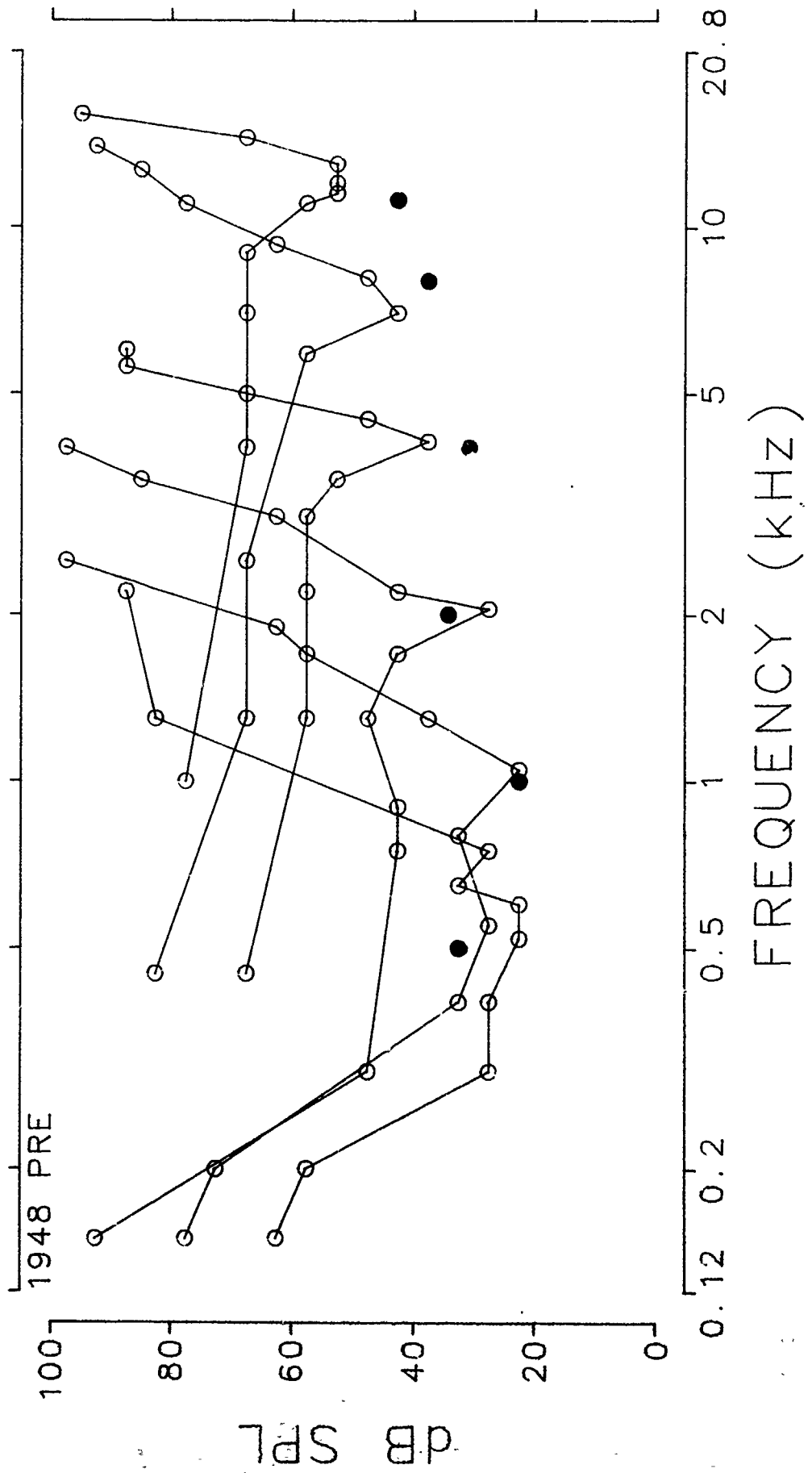


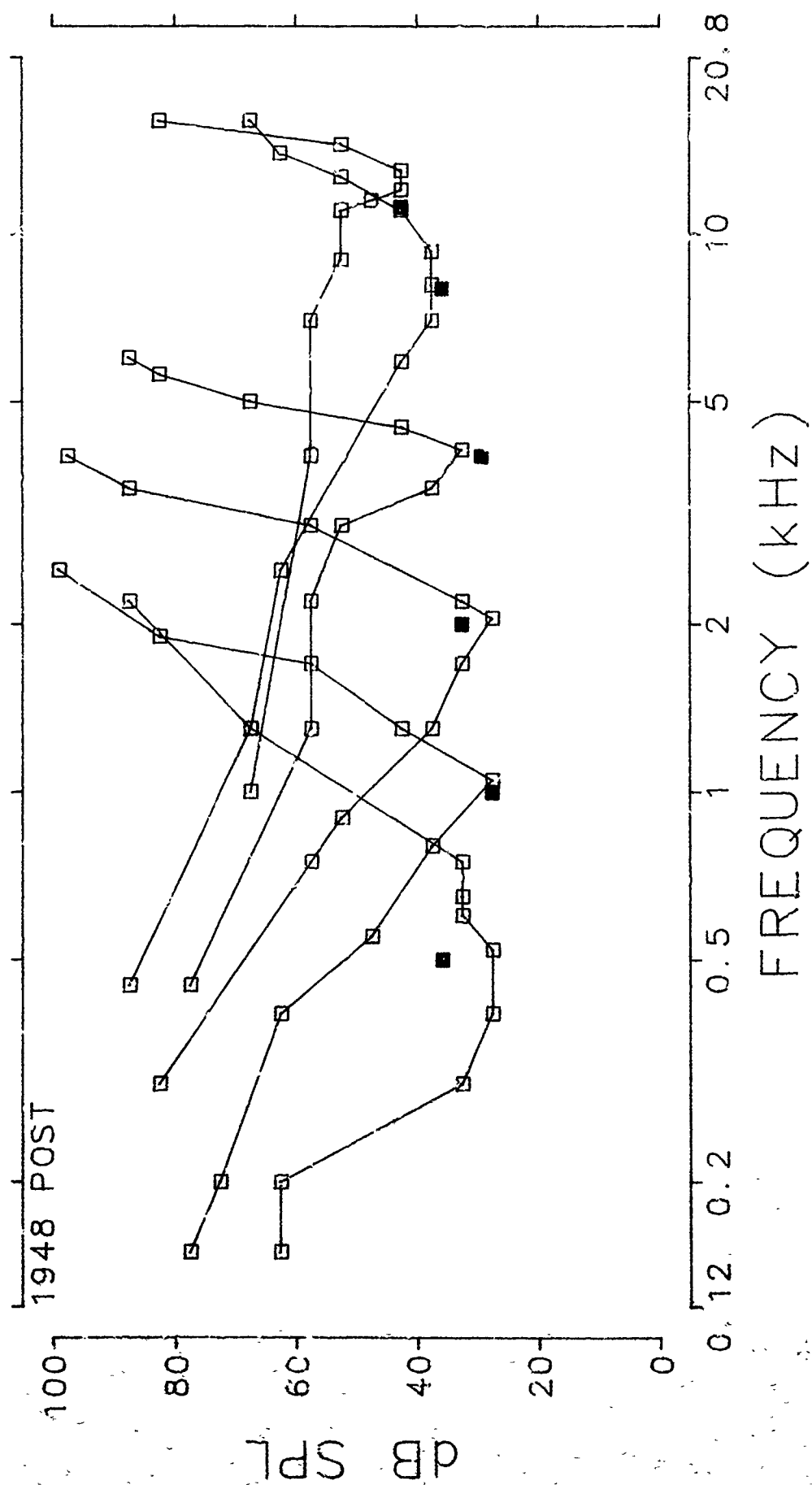


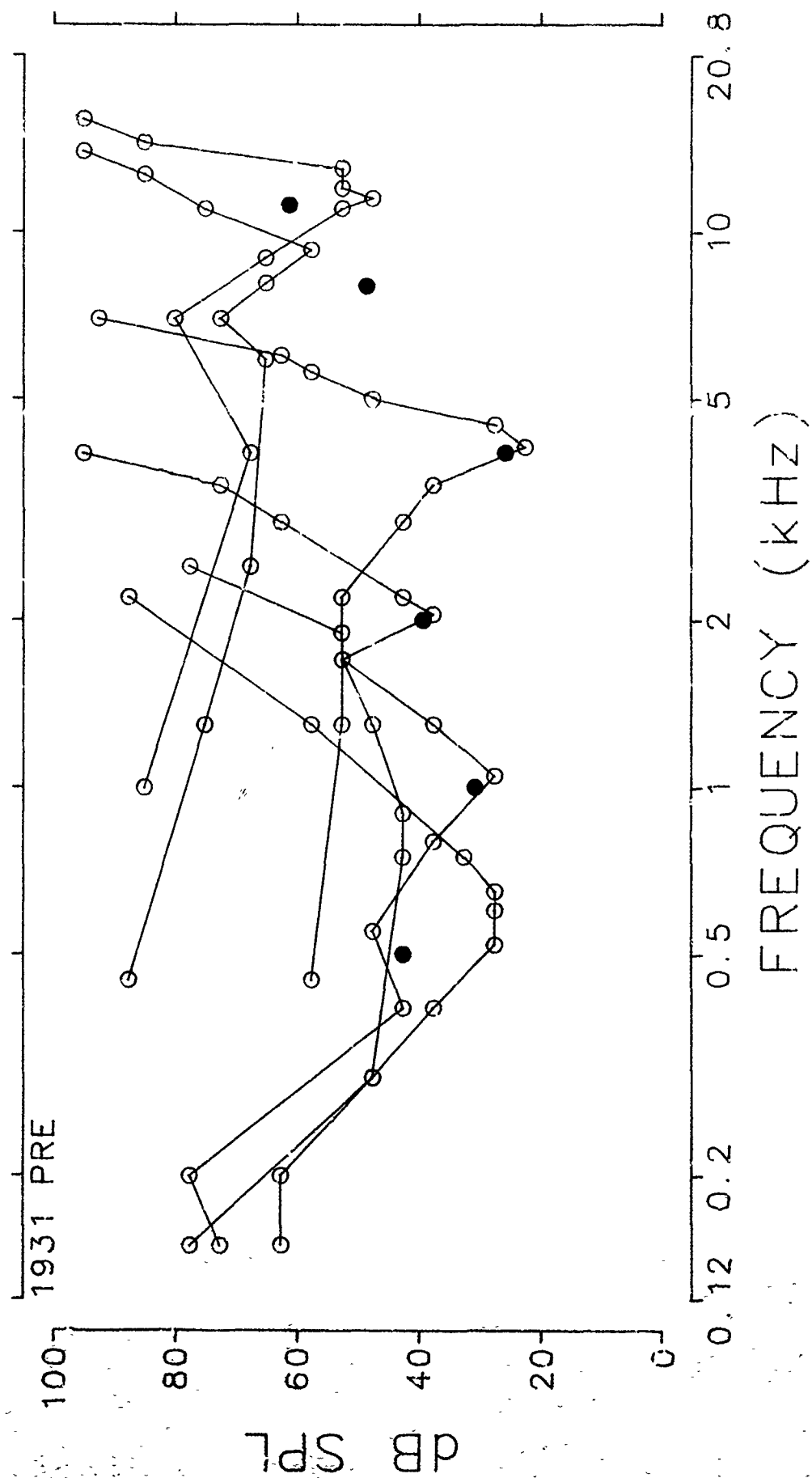


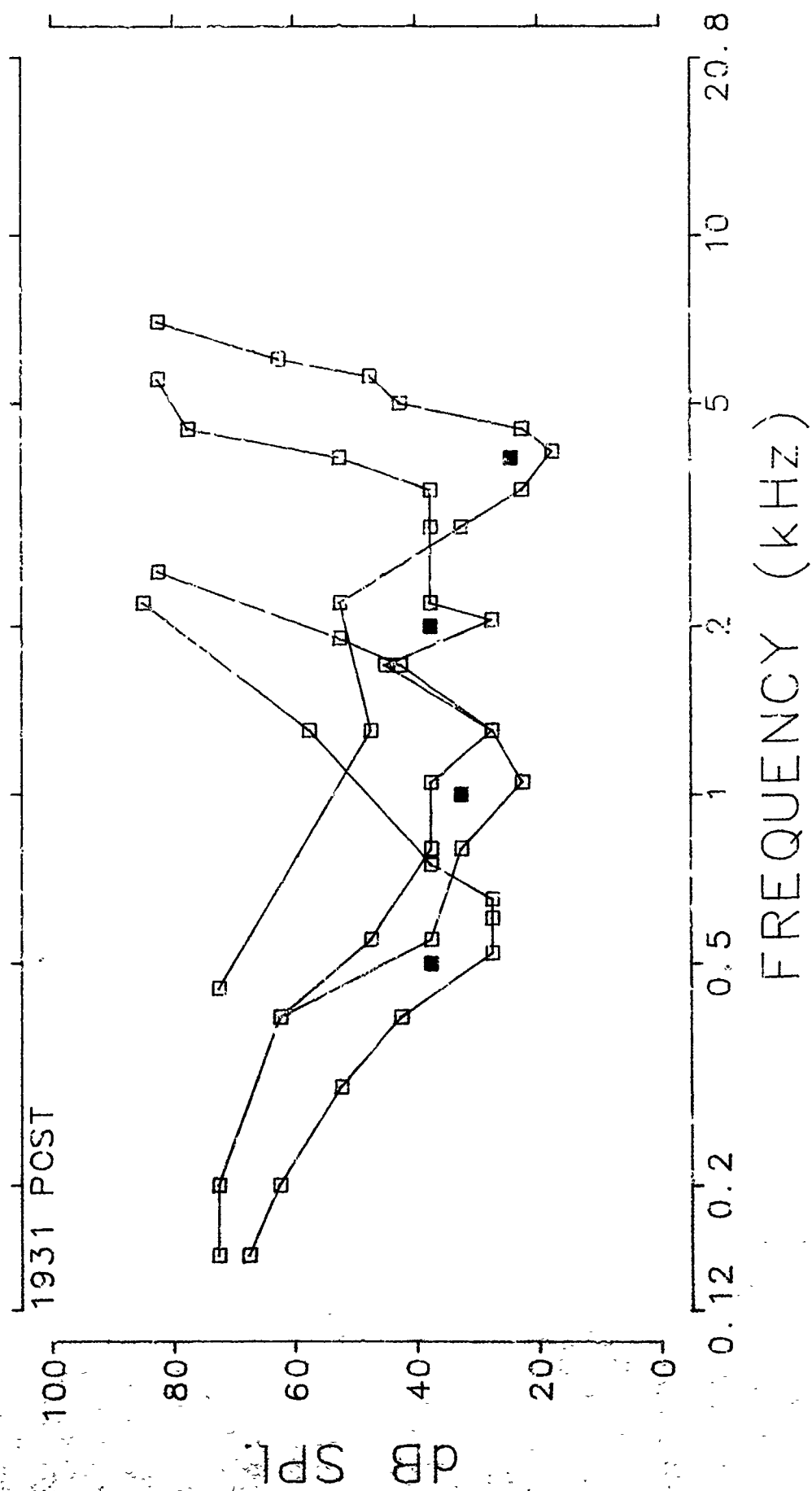












SHOCK TUBE EXPOSURE
155 dB, 10X, 1/10 MIN

TOTAL NUMBER OF COCHLEAR SENSORY CELLS MISSING

| ANIMAL NUMBER | INNER HAIR CELLS | 1ST ROW OUTER HAIR CELLS | 2ND ROW OUTER HAIR CELLS | 3RD ROW OUTER HAIR CELLS | TOTAL OUTER HAIR CELLS |
|------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------------------------|
| R1925R | 11 | 156 | 289 | 135 | 580 |
| R1931R | 17 | 25 | 50 | 46 | 121 |
| R1948R | 1 | 34 | 41 | 106 | 181 |
| R1967R | 28 | 101 | 130 | 141 | 372 |
| R1974R | 6 | 64 | 100 | 168 | 332 |
| GROUP MEAN | 13 | | | | 317 |
| S.D. | 10 | | | | 180 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND LENGTHS OF THE
COCHLEA CENTERED AT THE FREQUENCIES INDICATED

| OCTAVE BAND CENTER FREQUENCY | INNER HAIR CELLS | OUTER HAIR CELLS |
|------------------------------------|------------------------|------------------------|
| GROUP MEANS | | |
| 0.125 kHz | 2.8 | 51.0 |
| 0.25 kHz | 2.2 | 34.2 |
| 0.5 kHz | 1.0 | 45.0 |
| 1 kHz | 1.2 | 48.6 |
| 2 kHz | 2.0 | 80.8 |
| 4 kHz | 1.4 | 25.4 |
| 8 kHz | 1.2 | 21.4 |
| 16 kHz | .8 | 10.8 |

STANDARD DEVIATIONS

| | | |
|-----------|-----|-------|
| 0.125 kHz | 2.2 | 16.4 |
| 0.25 kHz | 2.0 | 18.5 |
| 0.5 kHz | 1.2 | 42.0 |
| 1 kHz | 1.3 | 42.2 |
| 2 kHz | 1.9 | 106.8 |
| 4 kHz | 2.2 | 19.2 |
| 8 kHz | 2.2 | 11.4 |
| 16 kHz | .8 | 7.1 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1925R | | | | | | | |
| 0.125 kHz | 2 | 5 | 14 | 30 | 49 | 0 | 1 |
| 0.25 kHz | 4 | 1 | 2 | 46 | 49 | 0 | 0 |
| 0.5 kHz | 1 | 10 | 8 | 13 | 31 | 0 | 1 |
| 1 kHz | 1 | 24 | 65 | 16 | 105 | 1 | 4 |
| 2 kHz | 2 | 99 | 155 | 13 | 267 | 1 | 13 |
| 4 kHz | 0 | 7 | 35 | 7 | 49 | 0 | 0 |
| 8 kHz | 0 | 8 | 7 | 3 | 18 | 0 | 0 |
| 16 kHz | 1 | 2 | 3 | 7 | 12 | 0 | 0 |
| TOTALS | 11 | 156 | 289 | 135 | 580 | 2 | 19 |

CHINCHILLA R1931R

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1931R | | | | | | | |
| 0.125 kHz | 4 | 5 | 15 | 20 | 40 | 0 | 0 |
| 0.25 kHz | 4 | 1 | 4 | 2 | 7 | 0 | 0 |
| 0.5 kHz | 3 | 5 | 2 | 8 | 15 | 0 | 0 |
| 1 kHz | 0 | 5 | 8 | 7 | 20 | 0 | 0 |
| 2 kHz | 1 | 4 | 3 | 1 | 8 | 0 | 1 |
| 4 kHz | 2 | 3 | 11 | 3 | 17 | 0 | 0 |
| 8 kHz | 1 | 0 | 2 | 2 | 4 | 0 | 0 |
| 16 kHz | 2 | 2 | 5 | 3 | 10 | 0 | 0 |
| TOTALS | 17 | 25 | 50 | 46 | 121 | 0 | 1 |

CHINCHILLA R1948R

| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1948R | | | | | | | |
| 0.125 kHz | 1 | 7 | 18 | 33 | 58 | 0 | 1 |
| 0.25 kHz | 0 | 5 | 5 | 28 | 38 | 0 | 1 |
| 0.5 kHz | 0 | 4 | 2 | 14 | 20 | 0 | 1 |
| 1 kHz | 0 | 1 | 2 | 7 | 10 | 0 | 0 |
| 2 kHz | 0 | 5 | 2 | 7 | 14 | 0 | 1 |
| 4 kHz | 0 | 5 | 1 | 2 | 8 | 0 | 0 |
| 8 kHz | 0 | 7 | 11 | 12 | 30 | 0 | 0 |
| 16 kHz | 0 | 0 | 0 | 3 | 3 | 0 | 0 |
| TOTALS | 1 | 34 | 41 | 106 | 181 | 0 | 4 |

TOTAL SENSORY CELL LOSSES OVER OCTAVE BAND FREQUENCIES

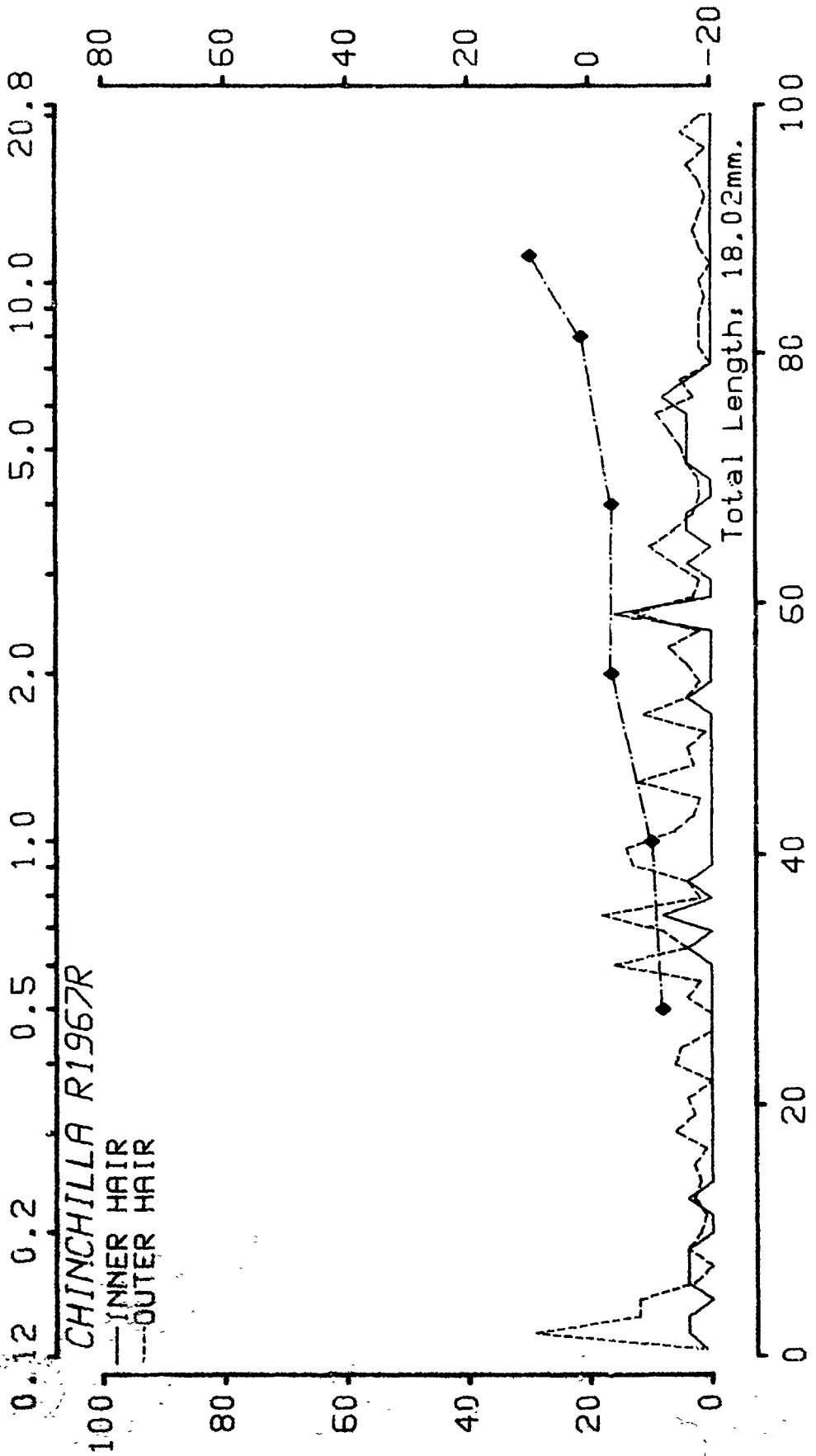
| | INNER HAIR CELLS | 1st ROW OUTER HAIR CELLS | 2nd ROW OUTER HAIR CELLS | 3rd ROW OUTER HAIR CELLS | NET OUTER HAIR CELLS | INNER PILLAR CELLS | OUTER PILLAR CELLS |
|-------------------|------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------|
| CHINCHILLA R1967R | | | | | | | |
| 0.125 kHz | 6 | 13 | 24 | 38 | 75 | 0 | 0 |
| 0.25 kHz | 3 | 8 | 9 | 8 | 25 | 1 | 0 |
| 0.5 kHz | 1 | 10 | 19 | 12 | 41 | 0 | 0 |
| 1 kHz | 3 | 28 | 28 | 26 | 82 | 2 | 1 |
| 2 kHz | 5 | 19 | 16 | 16 | 51 | 0 | 1 |
| 4 kHz | 5 | 9 | 15 | 19 | 43 | 0 | 0 |
| 8 kHz | 5 | 8 | 11 | 14 | 33 | 0 | 0 |
| 16 kHz | 0 | 6 | 8 | 8 | 22 | 0 | 0 |
| TOTALS | 28 | 101 | 130 | 141 | 372 | 3 | 2 |

CHINCHILLA R1974R

| | | | | | | | |
|-----------|---|----|-----|-----|-----|---|---|
| 0.125 kHz | 1 | 1 | 3 | 29 | 33 | 0 | 1 |
| 0.25 kHz | 0 | 0 | 8 | 44 | 52 | 0 | 0 |
| 0.5 kHz | 0 | 19 | 51 | 48 | 118 | 0 | 0 |
| 1 kHz | 2 | 9 | 8 | 9 | 26 | 0 | 0 |
| 2 kHz | 2 | 20 | 22 | 22 | 64 | 2 | 4 |
| 4 kHz | 0 | 4 | 2 | 4 | 10 | 0 | 0 |
| 8 kHz | 0 | 9 | 5 | 8 | 22 | 0 | 1 |
| 16 kHz | 1 | 2 | 1 | 4 | 7 | 0 | 0 |
| TOTALS | 6 | 64 | 100 | 168 | 332 | 2 | 6 |

Cochleograms and PTS Audiograms
for Individual Animals

FREQUENCY (KHz)



% CELL LOSS

% TOTAL DISTANCE FROM APEX

FREQUENCY (kHz)

0.12 0.2 0.5 1.0 2.0 5.0 10.0 20.8

CHINCHILLA R1974R

— INNER HAIR
--- OUTER HAIR

% CELL LOSS

100

80

60

40

20

0

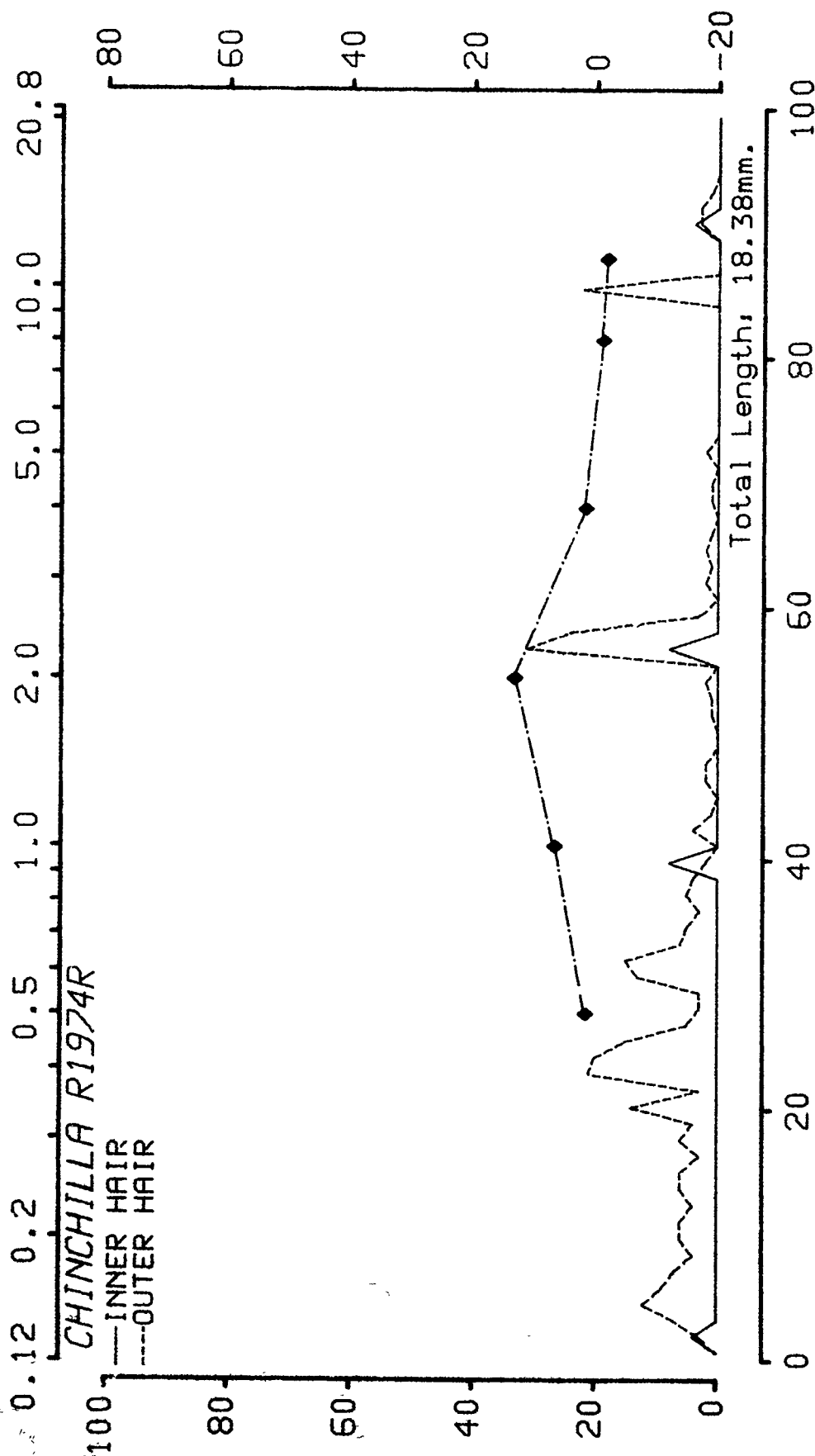
PTS (dB)

80 60 40 20 0 -20

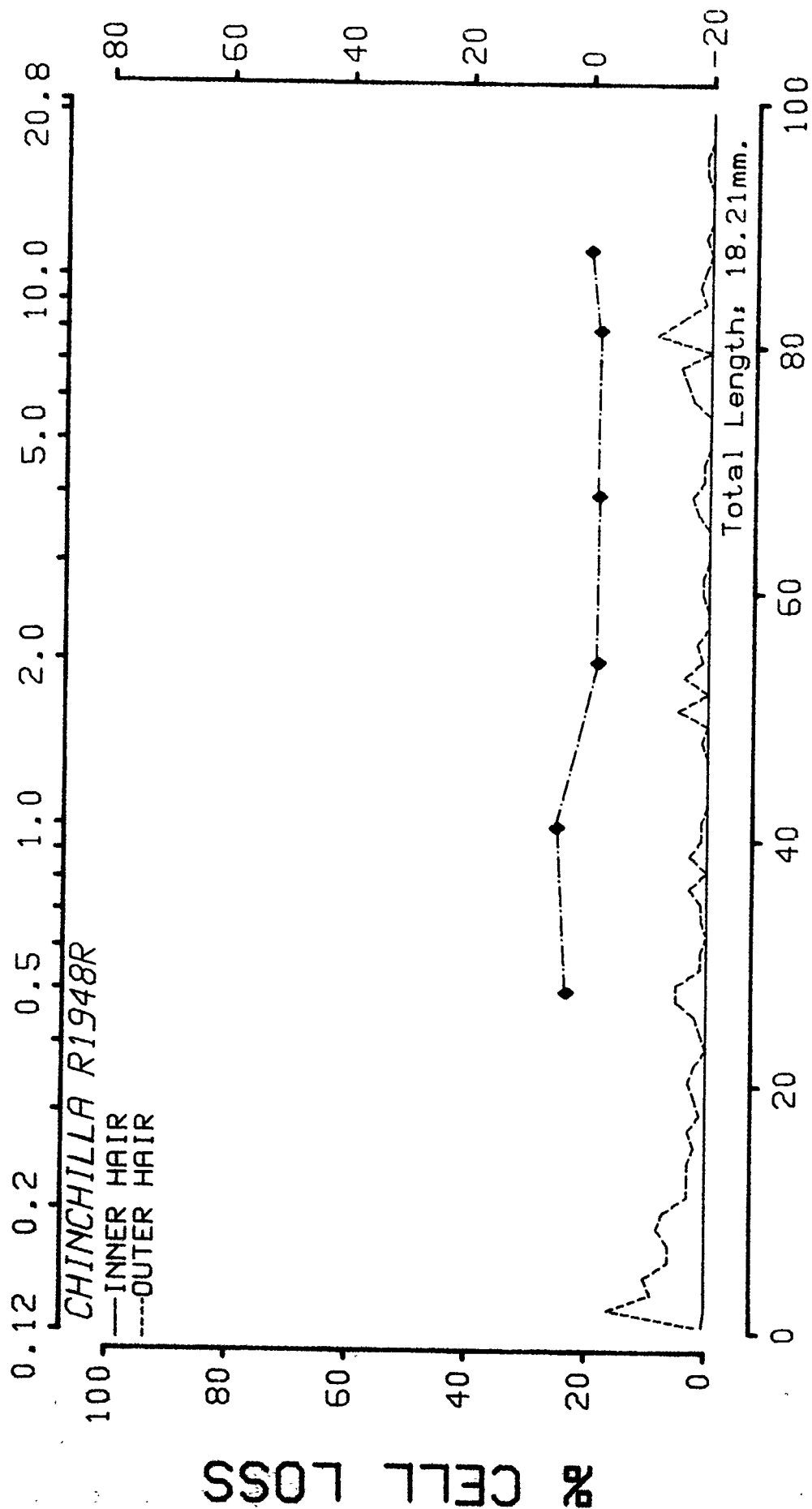
Total Length: 18.38mm.

% TOTAL DISTANCE FROM APEX

0 20 40 60 80 100



FREQUENCY (kHz)

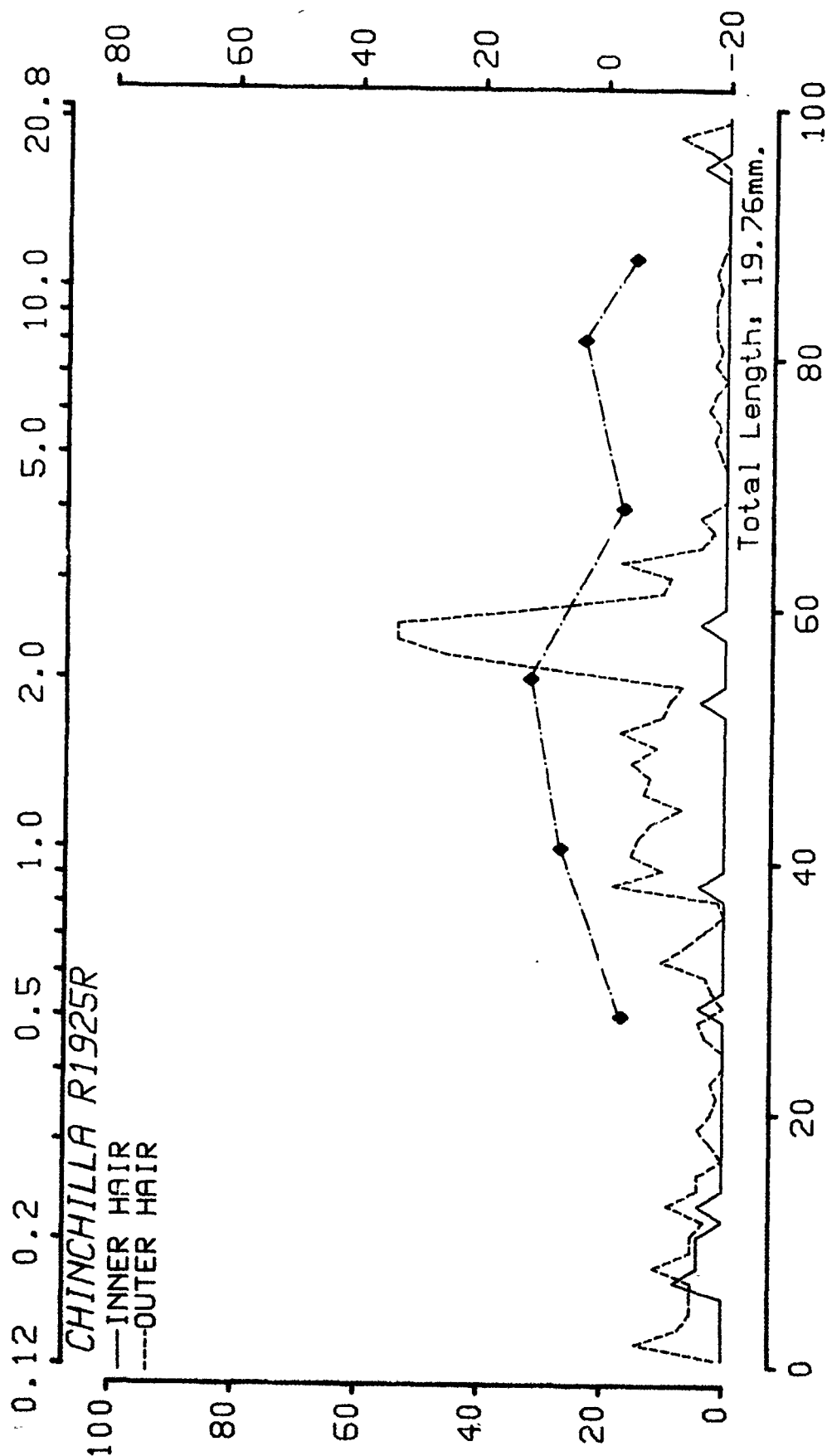


PTS (dB)

% TOTAL DISTANCE FROM APEX

% CELL LOSS

FREQUENCY (kHz)



PTS (dB)

% TOTAL DISTANCE FROM APEX

% CELL LOSS

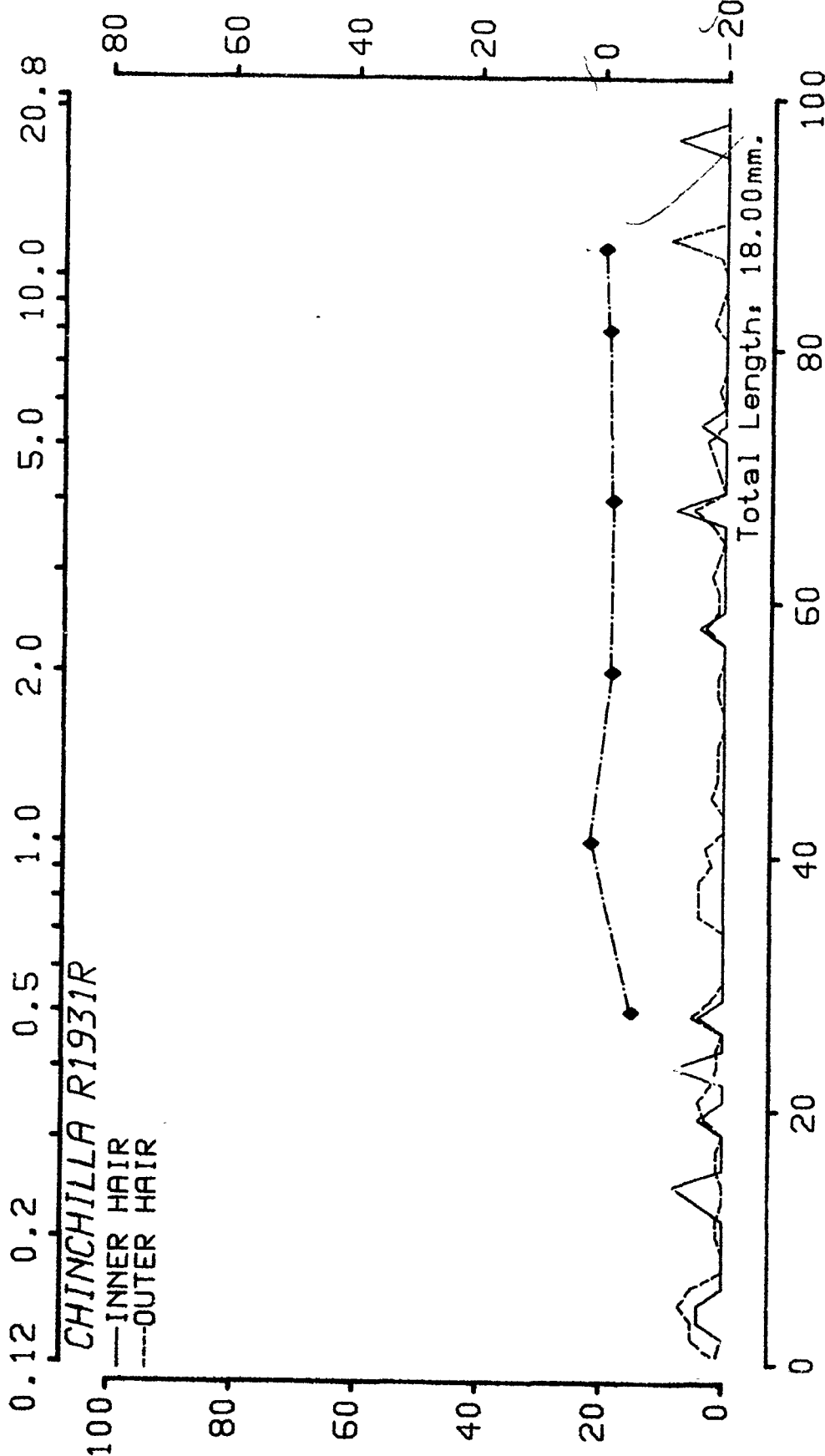
FREQUENCY (KHZ)

0.12 0.2 0.5 1.0 2.0 5.0 10.0 20.8

CHINCHILLA R1931R

— INNER HAIR
--- OUTER HAIR

% CELL LOSS



FTS (dB)

80 60 40 20 0 -20

Total Length: 18.00mm.

0 20 40 60 80 100

% TOTAL DISTANCE FROM APEX